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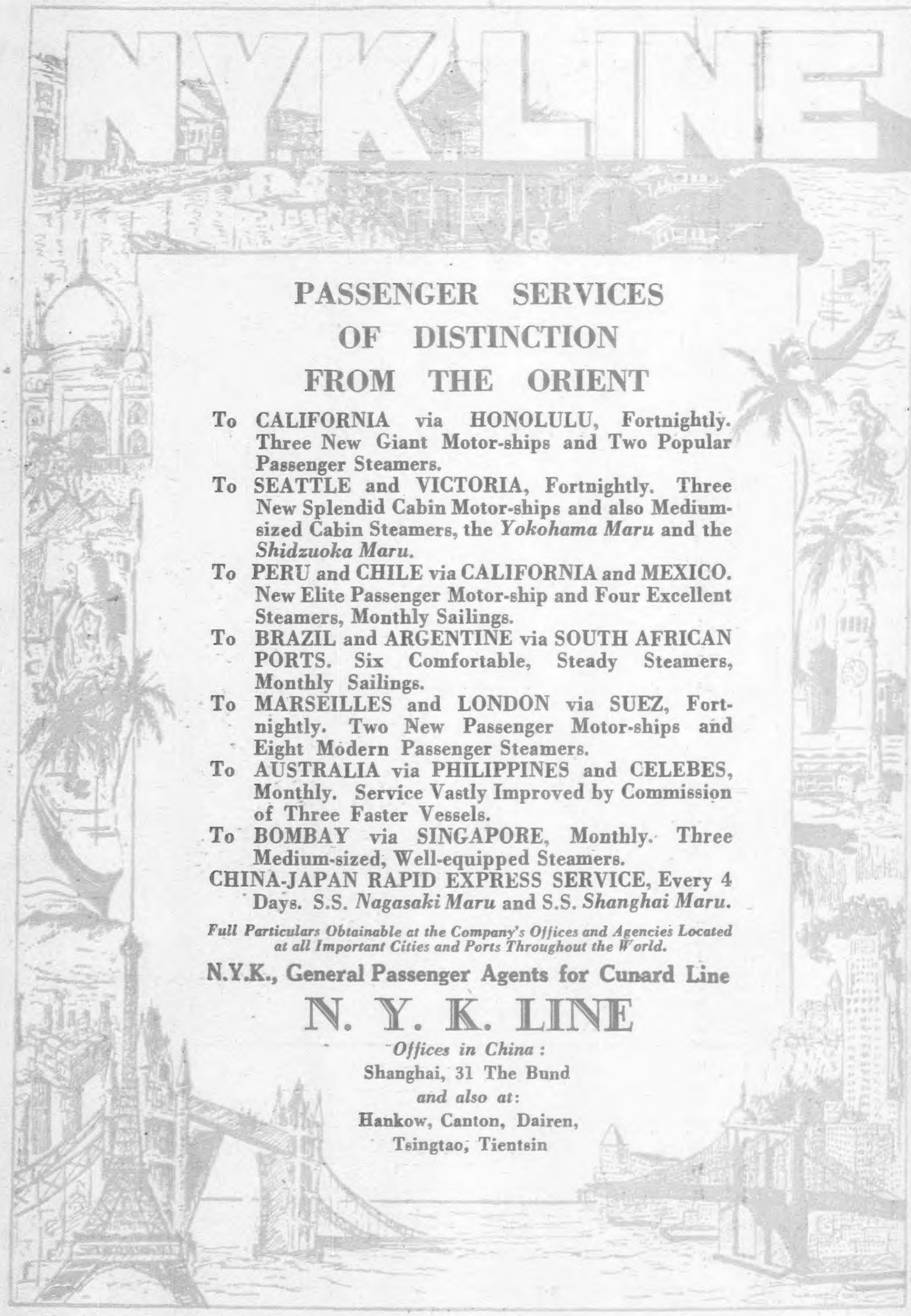


上海黃浦灘念四號

遠東時報

HOOVER IN CHINA
NANKING THROWS A BOOMERANG
ADVENTURES IN AMERICAN JOURNALISM
OUR SANCTUARY
CANTON—A WORLD PORT
BUILDING A NEW SHANGHAI
ASIATIC MARINE SUPPLEMENT

Vol. XXVII | JUNE, 1931 | No. 6



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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXVII SHANGHAI, JUNE, 1931 No. 6

Hoover Doesn't Have to Explain

The Kaiping Mining Deal Revived

As 1932 draws nigh, the Grand Old American Knocker is starting to knock. The campaign of slander, inuendo and calumny that precedes a national political convention is well under way. In anticipation of President Hoover's renomination, we are being regaled with a rehash of the story of his connection with the old Kaiping Mining Deal. One of the most biased and incomplete reports of this spectacular transaction that has been offered to the public under the guise of impartiality, has recently appeared in the form of a book entitled "*The Great Mistake*" by John Knox. The cover of the book, asks the question. "*Can Herbert Hoover Explain His Past.*" The writer claims there is a growing discontent with the executive performance of Mr. Hoover and that a notable feature of this discontent is the rising tide of the disparaging stories which are told about the President, strange cracklings of gossip and accusation which run along the grapevine telegraph which spreads its network into every corner of American life. It is a great mistake says Mr. Knox to let these stories go unchallenged or unproven, and Mr. Hoover and his friends owe the public a complete and convincing refutation or explanation of the stories that are told about him.

Mr. Knox devotes much of his book to Mr. Hoover's part in the Kaiping Mining deal of 1900, taking his facts largely from the newspaper reports of the case brought by Chang Yen-mao in 1905 against Mr. Moreing and the Chinese Engineering and Mining Company, Ltd., for recovery of Chinese administrative control of the Kaiping properties. We agree in that the abridged British newspaper reports of that trial leaves the reader with a feeling that Mr. Hoover's employers were guilty of sharp practice. In fact, Mr. Justice Joyce of the Chancery Division of the High Court of Justice, who heard the case and delivered judgment, closed his decision with the following words:

....."*in the investigation taken before me of the transaction in question, it has not been shown to me that his Excellency Chang has been guilty of any breach of faith or of any impropriety at all, which is more than I can say for some of the other parties concerned.*"

The full story of the Kaiping Mining transaction was never brought out at the above trial, which had nothing to do with the legality of the original transfer of the property or of the financial end of the deal which converted a Chinese official enterprise into a British share company during a time of war. The whole Chinese case revolved around the validity of a subsequent Memorandum of Transfer which stipulated that the management of the company was to be conducted by two boards, one in China and one in London, and that Chang Yen-mao would hold the position of Director-General in supreme control of affairs. All the Chinese wanted after the debts of the old company were paid and new capital raised for carrying on operations, was full administrative control with the powers to put into practice the old system of squeeze which diverted the profits into their own pockets. No more, no less.

The collective indictment of the defendants by the British judge may have been justified by the evidence brought forth at the trial, but in view of all that is now known of both sides of the controversy, it seems unduly harsh and uncalled for. His reflection on the good faith of the defendants is remembered when the rest of his lengthy and highly technical decision is forgotten. The Chinese asked for justice in a British Court and they got it—on paper. The effect of Justice Joyce's decision was to give the plaintiffs rescission of a contract which could not be rescinded except upon terms which the plaintiff was not willing to accede to. The court gave the plaintiff the right to enter a claim for what damages he had suffered by the company breaking the agreement, and the Supreme Court of Judicature on an appeal of the case, upheld the lower court, but stayed all further proceedings!

In other words, Chang Yen-mao established before the British courts the validity of the memorandum giving him full control over the properties as Director-General in China for life, but as this memorandum violated the British Companies' Law which provides that all British Companies must be directed by a board elected by the shareholders in England, it could not be enforced. In his ignorance of British law, Chang or his attorney made the mistake of signing a deed of sale in July 1900, without qualification and when, after the formation of the company in England and the raising of new capital, he stipulated the conditions of transfer, they could not be legally carried into effect. Chang was left with a claim for damage which was finally paid in full in 1912 on the amalgamation of the old Chinese Engineering and Mining Co., with the Lanchow Mining Company and their organization into the present Kailan Mining Administration. From the legal point of view the old controversy terminated harmoniously with the new deal. The slate was wiped clean.

It is difficult to reconstruct the case at this late date, when the leading participants in the transaction have passed away. Only the juniors remain, and amongst them is Herbert Hoover, the 24 year old mining expert who at that period was struggling to hold a good position and keep the good will of his employers. At no stage of the deal was Mr. Hoover a principal. He acted as an agent, a stakeholder, into whose hands was entrusted the original deed of sale, which transferred the Chinese Government Kaiping Mines to British ownership in order to save the properties from being confiscated by the Russians as spoils of war. At the time the deed was signed (July 1900) Russian troops occupied the mines and the railway. They even grabbed a concession at Tientsin in order to cut off the British concession from the railway station, and there was every evidence that they intended to annex the whole of North China.

The story of the Kaiping Mining Deal was told in the November 1928, issue of *The Far Eastern Review*. Mr. Knox calls upon President Hoover or his friends to explain his part in this transaction. Mr. Hoover's part stands out clearly without need of explanation. There is not a man alive to-day who can tell the real story of all that went on behind the scenes in 1900. It is, however, known that the deal was part of a complicated international intrigue of the early part of the century, a play for empire, for power and the spoliation of China by secret forces whose existence was recognized only by the inner-most circles of European diplomacy. To try and connect an inexperienced 24 year old American mining engineer, two years out of a California college, with these plots is to say the least, fantastic. Even our own State Department was maintained in sublime ignorance of what was

going on. All through Mr. Knox's book he calls upon Mr. Hoover for a frank disclosure of facts, which need no explanation. Mr. Knox simply opened up the files of *The Times* of 1905, and copied the reports of the trial as therein set forth and let it go at that.

Mr. Knox does not distinguish between the original deed of sale handed to Mr. Hoover in July 1900 and the Memorandum of Transfer of February 1901, drawn up after the Company had been registered in England, and a bond issue floated to pay old debts and to provide working capital. The validity of the initial deed of sale was never questioned. It was not secured by "main force." If any force was employed, it obviously came from the Chinese anxious to protect their properties by deeding them over to foreigners.

Mr. Hoover was not the only American handed a deed of sale for important Chinese properties in North China at that time. Mr. Charles Denby, subsequently American Consul-General at Shanghai and Vienna, resided in Tientsin during the Boxer Year and without consulting the records, we recall that the Chinese deeded over to him the China Merchants' Steam Navigation Company's properties, the Imperial Bank of China and other valuable holdings in order to save them from confiscation. To suggest that the young American engineer secured by "main force" something that the Chinese would gladly have rewarded him for taking off their hands, indicates how little Mr. Knox understands his subject and how unfair he has been to the Chief Executive of the Nation.

Mr. Knox's woeful ignorance of things Chinese is also revealed in the following passage in his book;

> "In the testimony of this and the previous days, one condition seems to be more or less clearly established—that Mr. Hoover went to China as a salaried employee of Chang and that while receiving that salary he carried on correspondence with Moreing which was eventually greatly to the disadvantage of Chang. There is a strong suggestion that Mr. Hoover was guilty of biting the hand that fed him."

Rot! Chang used Moreing to raise funds for him in Europe secured on the Kaiping Mines. Moreing placed a £200,000 bond issue on the London market at 12 per cent, subscribing to half the amount himself. Moreing was therefore personally interested in the mines. Chang then requested Moreing to send him an expert mining engineer and Moreing took Hoover from Australia and ordered him to China. Hoover was nominally a paid employee of the Chinese Government, but he also held the representation of Bewick, Moreing & Co., and as we recall, had an office in Tientsin under that name. Nothing wrong about that. We could cite many other instances in China, where advisers and experts employed by the Chinese Government were loaned by foreign firms or governments and drew salaries from both sides. Anyhow, there is nothing to indicate that Mr. Hoover betrayed Chang's trust in retaining a connection with his old employers. As a matter of fact, before he could accept the deed of sale to the Kaiping Mines entrusted to him in the name of Bewick, Moreing & Co., he had to telegraph to London for authority to act for them in this matter.

The real facts worth while considering in any controversy over this old transaction are revealed in a study of the financial conditions of the semi-official Chinese enterprise and the new British company. The old Chinese Engineering and Mining Company, capitalized at Taels. 1,500,000 (G.$1,125,000) never paid more than a nine per cent dividend, say G.$100,000. The debts and obligations of the old Company taken over by the new, approximated £600,000. These debts had to be paid and working capital raised to enable the new company to proceed with the operation of the mines and the construction of the harbor at Chingwangtao.

When Hoover assumed charge as Chief Engineer the new Company was capitalized at G.$5,000,000 with a bonded indebtedness of G.$2,500,000, and during the first year he showed a profit of G.$525,000 and $650,000 the second year. In other words, it was conclusively proven that for years the Chinese officials plundered the company of the difference between G.$600,000 and G.$100,000, the money going to the viceroy to pay the expenses of the Peiyang fleet and to propitiate the Throne.

The old Chinese company, was not only facing bankruptcy and foreclosure by its creditors, but the Russian forces had seized the properties and announced their intention to confiscate them as spoils of war. This was the situation when the Chinese deeded over the properties to Bewick, Moreing & Co., in July 1900 in the hope that its immediate registration as a British company would save it from Russia.

The Kaiping concession, since merged with the Lanchow mines and now known as the Kailan Mining Administration stands to-day as a monument to honest direction, a tribute to the executive skill of the young American mining engineer who eliminated graft and corruption at the outset and transformed a bankrupt property into one of the most profitable mining enterprises in the world. Let that fact stand to his credit.

There are many obscure points connected with the old Kaiping deal that could be clarified, but Herbert Hoover is certainly not called upon to explain what he knew nothing about. His part in the transaction as stake holder, intermediary or agent, is clear and above criticism. His British employers and their Belgian associates, confronted with a peculiar obstacle to the formation of a British company arising from the pledges of the British Foreign Office to support its official group in these regions, had to resort to rather devious methods in order to attain their ends. They pitted their wits against a group of Chinese just as sharp and won out. Chinese officials may have lost control of the properties and the handling of the large juicy profits that they formerly diverted into their own pockets, but the nation as a whole has benefitted.—G.B.R.

Henry W. Kinney's New Book

Mr. Henry W. Kinney of Dairen has brought out another interesting book on Manchuria under the title "Manchuria To-day." This volume, like those that have preceded it, is designed to present briefly the principal features of the economic situation in Manchuria with special reference to the activities and aims of the South Manchuria Railway Company.

In the opening chapter of "Manchuria To-day" is given a resumé of the outstanding events of recent years under the subheadings, "The New Régime"—"Sino-Soviet Relations"—"Partisans, Communists and Bandits"—"Japanese Policies and Interests"—"Chinese Build Railways"—"Motives for Construction"—"Port at Hulutao"—"Extension of Influence"—"Other Chinese Activities" and "Future Prospects." The remainder of the text largely is the same at that contained in Mr. Kinney's "Modern Manchuria," which was published in 1929, but this portion has been thoroughly revised, particularly in the matter of statistical information. The new book is most profusely illustrated and most of these illustrations are new.

As Mr. Kinney sets forth in a foreword, the South Manchurian Railway Company as a semi-government institution is one of the main factors in the advancement of Japan's aims and policies in Manchuria and the writer again emphasizes that these aims and policies are not colonization or political control, but the development of the abundant resources of this rich, hitherto only partly settled territory, and its consequent increase in population and purchasing power.

The writer explains how the South Manchuria Railway is much more than a transportation system operating for profit, for besides providing Manchuria with a highly efficient railway and assisting the Chinese to build railways of their own, the activities of the Company include numerous functions contributing materially to increase agricultural and industrial production and commerce besides spending immense sums on education, hospitals, sanitation and other enterprises for the benefit of the population generally, from which no financial returns are expected.

The new volume, which includes an excellent map in color, is in brown and gold cloth of handy size and attains a high degree of excellence typographically.

Adventures in American Journalism

IN THE FAR EAST

JUST A — — LIE !

"THE FAR EASTERN REVIEW," a Japanese monthly review in Shanghai, but which employs Britishers as editors, in the January issue in an editorial article dealing with "Drawing Lines on a Map" by George Bronson Rea, a professional propagandist employed by the Japanese, referring to the Manchurian tangle, has the following to say:" (From "The China Weekly Review," March 14, 1931, page 56).

FOR the past fourteen years, the publication known at various periods as *Millard's Review, Review of the Far East* and *The China Weekly Review*, appearing as a Delaware corporation and operating under the name of The Millard Publishing Company, has seen fit consistently to misrepresent the nationality and ownership of THE FAR EASTERN REVIEW, and in other ways has endeavored to impair its value as an advertising medium. There is nothing to be gained by instituting a civil action against an outfit that has nothing to lose. About all that can be done to counteract such statements as the above, is to keep the record straight by filing occasionally with the American authorities a certificate of ownership to preserve one's registration as an American publication.

Keeping the Record Straight

From the time it started publication in 1904, THE FAR EASTERN REVIEW has been known throughout the newspaper world as an American publication. In June 1917 (two months after the United States entered the war) a new weekly review sponsored as a Delaware corporation made its appearance in Shanghai violently waving the American flag, and shortly afterwards grapevine stories began to circulate that THE FAR EASTERN REVIEW had been sold to British interests and was no longer entitled to American registration or advertising support. This false report was communicated to the Acting American Commercial Attaché in Peking who without investigation, incorporated it in a special official document entitled "*The Conduct of American Business with China*" issued by the Department of Commerce as a guide for American firms seeking to establish connections with this market.

THE FAR EASTERN REVIEW was one of the corporate members of the American Chamber of Commerce of China, organized after the outbreak of the war in 1915. In its first two years of existence, the chamber had few members and insufficient funds to pay for a headquarters or the services of a secretary. The Associate Editor of this magazine, a duly qualified trade expert, (previously secretary of the American Business Men's Association of Manila), gave his time and services to the new organization without pay and conducted its correspondence from a small room in the offices of this magazine. These services were rendered cheerfully and with no thought of using the connection to advance the special interests of THE FAR EASTERN REVIEW. In 1917 our assistant editor resigned both positions and the vacancy in the chamber was filled by the editor of the new flag-waving weekly, who by reason of this connection, was in close and confidential communication with the Department of Commerce officials in China. The Publisher of THE FAR EASTERN REVIEW entered the army when the United States joined the Allies and was absent from China for over three years entrusting the business to his associate, an Australian journalist of high character who represented *The New York Herald* in China and enjoyed the full confidence and trust of the American Legation and consular officials.

THE FAR EASTERN REVIEW was entitled to protection and consideration from the secretary of the chamber it had helped to

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Republic of China
Province of Kiangsu
City of Shanghai
Consulate General of the
United States of America

Statement of the Ownership, Management, Circulation, etc. Required by the Act of Commerce of America of August 24, 1912

THE FAR EASTERN REVIEW

Published monthly at Shanghai, China, for June 1, 1931

Before me, the American Consul-General at Shanghai, China, personally appeared George Bronson Rea, who, having been duly sworn according to the law, deposes says that he is the Business Manager of *The Far Eastern Review*, and that the following is a true statement of the ownership, management, etc, of the aforesaid publication, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations.

1. **That the name and address of the publisher, editor, managing editor, and business manager is: George Bronson Rea, Address 24 The Bund, Shanghai, China.**
2. **That the owner is: George Bronson Rea, 24 The *Bund, Shanghai, China.***
3. **That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.**
4. **That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders, and security holders, as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.**

Further, affiant swears that *The Far Eastern Review* has not at the presnt time, nor has it had in any time in the past twenty-seven years any outstanding bonds, mortgages, overdrafts at banks or other credit accommodations whatsoever. It has no debts, nor is it under any obligations to any government, corporation, association or private individual or others, who might have the right to interfere in its business or influence its editorial thought or writings.

(Signed) GEORGE BRONSON REA.

(CONSULAR STAMP)

SWORN to and subscribed before me this 16th day of June, 1931.

(Signed) EDWIN S. CUNNINGHAM
Consul-General, U.S.A.

organize and support; at least the courtesy of a letter or telephone call regarding the truth of the statement in the official Department of Commerce booklet. It received neither. As soon as the official ducument arrived in China, the "Watchman at the Gate," gleefully quoted it editorially as convincing and corroborative evidence that the British were determined at all costs to hold their trade supremacy in China during the war!

THE FAR EASTERN REVIEW went on the American Black List and the advertising contracts of American firms swarming into China on the top wave of the war-trade boom were diverted to our patriotic contemporay, which in the meantime, had become the official organ of the American Chamber of Commerce and the American Court for China. The publisher of THE FAR EASTERN REVIEW remained in ignorance of the reasons why his business was falling off until his return to America after the termination of the Peace Conference. The Secretary of Commerce readily consented to rectify the mistatement in the official report issued by his department, but the lie had stood unchallenged for over a year. The damage had been done.

The publisher of the Delaware publication departed from Paris when the Shantung Decision was announced, proceeding to Washington as the agent of the Chinese Government to break the Versailles Treaty in the Senate and to incite American opinion against Japan. His collaborator, as secretary of the American Chamber of Commerce in Shanghai, manipulated American opinion in China and when THE FAR EASTERN REVIEW came out in opposition to the campaign for war in the Pacific, the American Chamber of Commerce in China promptly declared a boycott against it and brought pressure to bear upon the Chinese Chamber to do likewise. In two months, all its Chinese and nearly all its American advertising contracts were cancelled.

This plot, however, failed, for instead of injuring THE FAR EASTERN REVIEW, it provided the opportunity of readjusting its business on an increased scale of advertising rates, which more than made up for the old contracts cancelled as a result of the boycott. A group of American industrialists headed by the late Judge Gary extended to THE FAR EASTERN REVIEW their support to combat the campaign for war with Japan. The war-mongers in China found themselves pitted against the most powerful interests in the homeland, with THE FAR EASTERN REVIEW as their mouthpiece.

Stories were then broadcast that THE FAR EASTERN REVIEW had been sold to Japanese interests and a deliberate campaign was waged to ruin it and "*run its publisher out of the country.*" A libel suit was brought against it for a technical political phrase, asking for damages that represented what at that time was considered to be the full value of the property, hoping that if the decision went against it, it would be compelled to sell out in order to satisfy the judgment.

The case was a duplicate in miniature of the more celebrated attempt to intimidate the press in 1920, when Mayor Thompson of Chicago sought to silence criticism by filing a suit for ten millions against the *Chicago Tribune* for exposing the inefficiency and corruption of his government and impairing the credit of the city. The *Chicago Tribune* fought the case through to the Supreme Court, establishing the principle in law that no newspaper can be sued for the full value of its property in a civil action involving its right of free criticism.

At the same time that this epochal fight to preserve the liberties of the press was being waged at home, a determined effort to muzzle and ruin an American publication was being attempted in China, but with this difference. The Delaware exponent of journalistic ethics had been made the official organ of the American Court for China and the trustee for the majority shareholder (name unknown) was prosecuting the case. Although the prosecuting lawyer has since declared that this was merely a coincidence, at the time it looked as though the defendant would have to appeal for a change of venue and have the case taken to another court for trial.

Foiled in its various efforts to injure this publication our enterprising contemporary has endeavored to create the impression that in some mysterious way, THE FAR EASTERN REVIEW receives a subsidy from the Japanese Government, hoping that by constant harping on this theme, it will injure its value as a medium in China. The editor of our Delaware weekly was challenged in an open meeting of the American Chamber of Commerce to prove its right to a seat in the chamber and to its American registration by revealing the names of the majority shareholders represented in its incorporation papers and annual reports by trustees. He refused to answer, being supported by the then President of the chamber and others present at the meeting who were acting as dummy directors in another Delaware incorporated newspaper published in Shanghai which had been acquired by a group of Chinese officials! As a matter of fact, the editor of the Delaware weekly was officiating at the same time as the editor of the Delaware daily! As this system of employing American dummies to conceal the real ownership of American registered corporations has become recognized as quite legitimate and ethical, the editor of the Delaware weekly could not be compelled to disclose the names of his principals.

In 1927, when the Sovietized Nationalist forces ran amok at Nanking and it seemed as though they would march upon Shanghai and repeat the outrages, the international community came together as one man to defend their homes. Our versatile Delaware contemporary, however, demanded that all foreign warships and troops be recalled, advocating immediate surrender of the settlement to the Nationalist forces, that is, to the Soviet. The American Chamber of Commerce unanimously asked for his resignation, the only dissenting voice coming from the Editor of THE FAR EASTERN REVIEW, who defended his colleague's right to express his political opinions without being penalized!

At the same time, the American Chamber of Commerce, fearful of a repetition of the Nanking massacre with its outrages upon the persons of American women, frantically appealed to Washington for armed protection. The American Chamber urgently needed a representative in Washington to keep before the government the necessity of providing this protection during the emergency and as the Publisher of THE FAR EASTERN REVIEW was then in the Homeland convalescing from a severe illness, he was unanimously requested to act as the permanent representative of the Chamber to reside in Washington. The Publisher of this magazine, although unfit for active work, accepted this position without pay or expenses as a matter of duty, an obligation he owed to the community in which he lived and from which he derived his support.

During the three years he resided in Washington, discharging this duty to his fellow-nationals in China, a continuous virulent campaign was waged by the editor of the Delaware weekly and his radical friends, to destroy his usefulness, even to the extent of publishing the falsehood that the Anglo-American community in Shanghai had created a million-dollar fund for propaganda purposes in the United States to bring about armed intervention in China, and which was being expended by the Publisher of this magazine. The campaign to influence the American Government to withdraw its war-ships and troops, surrender immediately to the demands of the Nationalists and scuttle from China at a time of great danger and uncertainty, with the Soviet in control of the victorious Chinese armies, will stand in the annals of American journalism not only as one of the most despicable breaches-of-faith to a community by a newspaper, but a forcible and convincing example of how national interests may be betrayed in an acute international crisis by a publication whose real ownership is concealed behind the names of American trustees or a dummy board of American directors.

Our Delaware contemporary has no proof to support its statements about this publication, beyond the fact that about twenty-five per cent of its advertising revenues is derived from Japanese firms. There would be no difficulty in obtaining relief through an action for libel, but we could not prove damages for the simple reason that we have sustained none. On the contrary, this magazine has prospered as a direct result of its Japanese advertising. Japan is one of the most important engineering markets of the world. They are always doing big things in that country and all nations are keenly competing for its orders. American capital is deeply interested in the stability, progress and prosperity of Japan. American loans to that country total over $600,000,000 or five times our commercial stake in China. Japanese are co-operating with American manufacturers in selling their products in China, where they control industries capitalized at over a billion yen. These Japanese enterprises in China purchase as much as $50,000,000 of American products annually. Japan is our best customer in Asia. Her prosperity is indissolubly linked with our own. THE FAR EASTERN REVIEW has contributed its share towards bringing about this friendly co-operation between the two nations and is proud of it. Our policy is to preserve this bond of cordial friendship and profitable trade, as the one sure guarantee of peace in the Pacific

and the solution of those greater problems upon which depend the future status of China.

Japan is now the most important factor in the Far East, politically and economically. She cannot be ignored nor can her progress be checked by petty and spiteful propaganda, trade boycotts or secret economic warfare. Japan seeks friendly and sympathetic publicity in the same way that all industrial nations use the press of the world for advertising their products. Two of the big exporting nations have their National Associations of Advertisers who carefuly scan all foreign publications to ascertain whether or not their products are receiving fair play in the editorial columns of newspapers which carry the advertising of their manufacturers. This policy to support only those publications which are impartial and willing to reciprocate in legitimate publicity will harden and the independent newspaper publisher who relies on his advertising revenues to cover expenses, will be compelled to give heed to this new trend in international business.

It is not generally known that the boycott of Japanese goods in China included the rejection of all Japanese advertising in the vernacular and Chinese owned foreign language newspapers. This will help to explain why an "American" publication in China registered for several years as such behind concealed ownership, has consistently invited attention editorially to the Japanese advertising in THE FAR EASTERN REVIEW; another method of inciting the Chinese to include it in the boycott, exclude it from the mails and impair its value as a medium.

The advertising of Japanese manufacturers will in time become an essential source of income to newspapers in China operated on purely business lines. The Publisher who fails to read aright these signs of the times and who persists in antagonizing the Japanese by petty attacks upon the policies of their government and by fomenting ill-will and instigating boycotts and economic warfare can hardly expect to be favored with the advertising of their exporting firms. British newspapers may survive, but the main lines of British exports to China are rapidly shrinking, making it increasingly difficult for British publications to rely solely upon national advertising. It has never been possible for an American publication to operate in China depending upon national advertising for its support. The American Government has no ways or means of extending subsidies to national organs, and the American newspaper in the Far East, to succeed as a business enterprise, must seek its advertising from all nationalities and give them all a square deal in publicity. This may explain to our Delaware contemporary and others why THE FAR EASTERN REVIEW survives and prospers as an American owned and edited publication, while others who ignore the basic principles of successful journalism in the Orient have gone on the rocks.

G. B. R.

Nanking Throws a Boomerang

THIS time last year, Mr. Lennox Simpson was filling the editorial page of the *Peking Leader* with double-column commentaries on the wickedness of Chiang Kai-shek and the "Soong Dynasty," denouncing them as crooks, and disclosing even the exact sums alleged to have been sent out of the country and deposited to their credit in a Los Angeles Bank. These were serious charges and in any country where government is responsible to the people, the accused officials would have invited a full investigation in order to forestall an official inquiry.

Generalissimo Chiang and his Minister of Finance calmly disregarded the indictment drawn up by Simpson. They made no attempt to vindicate their official honor nor was there any censor in the new Central Yuan with the courage to introduce a bill of impeachment. The outside world is left to believe that the accusations were groundless and Nanking's final victory closed the incident.

Another revolt has broken out against Nanking or, to be exact, against the dictatorship of President Chiang Kai-shek. One of the principal members of his cabinet has gone over to the insurgents and accepted a high post in the new Kuomintang government set up in Canton. If anybody has an intimate knowledge of what has been going on behind the scenes in Nanking, it is Mr. Sun Fo, Minister of Railways in Chiang's cabinet. The mere fact that Sun Fo was a member of the National Government gave it prestige abroad and at home. Sun Fo, the son of Dr. Sun Yat-sen, graduate of the University of California and Columbia, was one of the pillars of the Nationalist regimé, a guarantee of its honesty and good faith, a man who enjoyed the confidence and respect of American bankers and others interested in the welfare of China. Mr. Sun Fo's secession from Nanking will have a most disquieting effect in the United States, where he has more friends and well-wishers than any other American-educated official of the National government. There have been rumors to the effect that Sun Fo had appropriated to his own use large sums of the public moneys, but the same stories have been circulated about every other high official of past and present Chinese Governments. Until such time as the Control Yuan can exercise its functions and impose a check or audit on military expenses, these stories will continue to circulate.

Last year, the Yen-Feng coalition openly accused President Chiang of appropriating to his own use millions of dollars of the public moneys. The same charges are repeated this year in a manifesto of the Canton Government. After charging him with having betrayed the republic and arrogating to himself the supreme authority in the new government, the manifesto goes on to say that he has as yet never made a single public statement of national accounts, alleging that he used to draw millions of dollars at a time from the Ministry of Finance on his personal chit, charging it to "special expenses."

As Chiang is immune from impeachment and as these matters cannot be taken to the polls for the public to pass judgment upon, it is fairly safe politically to accuse him of malfeasance. Owing to close family ties with Mr. Sun Fo, Chiang Kai-shek and his two ministerial brothers-in-law, have tactfully refrained from taking part in the war of recrimination that invariably precedes actual hostilities in China. The unpleasant task of hurling vituperation and aspersions upon the character and integrity of Sun Fo has therefore been delegated to a group of Chiang's military leaders headed by his Minister of War. The verbal dressing down that these accomplished artists have administered to the ex-Minister of Railways has no parallel in Chinese history for vindictive ferocity, abuse and ceremonial billingsgate. Sun Fo was denounced as "unprincipled, unfilial, avaricious, narrow-minded, emotional, a thief, a lump of garbage and a general all-round unmitigated scoundrel." The only insult omitted was to question his parentage. Yet this gem of Chinese invective ends with the expressed hope that the prodigal will return to Nanking where all his sins will be forgiven, if he will continue to play the game with his old associates!

The document is a most enlightening piece of official literature on the inside workings of Chinese politics, bringing up-to-date the exposures of Mr. Jermyn Lynn in his recent book "Chinese Political Parties" and the further interesting revelations of Mr. Tang Liang-li in his "Inner History of the Chinese Revolution." If true, only in part, it constitutes an arraignment of the National Government itself that no amount of explanation can soften or set aside. Sun Fo may be a rascal, but the document proves that his colleagues not only condoned his misconduct but are willing to forgive him. We quote the concluding paragraphs of this astounding document;

"Can any one possibly succeed, who is at once disloyal, unfilial, dishonorable and inconsiderate?"

"What a folly it is for you to participate so rashly in the rebellion!" the telegram emphasizes.

"It is said by some," the telegram continues, "that whatever may be your ostensible and professed pretexts, your real motive in proceeding to Canton is financial. For, in the last two or three years, the Ministry of Railways has collected from the various railways in the country over $20,000,000.

"It is said that you have kept absolutely secret the way in which such funds have been held in custody as well as the uses to which they have been put, and that you have never reported your accounts. You were therefore desirous of hushing up the matter by going away, so that what was public may become private property. Upon your arrival at Shanghai, you immediately participated in the plots at Canton.

"Knowing very well that this would affect the (bond) market, you instructed your treasury, the Ho Hong Bank, to speculate on bonds for you. Within 10 days, you have amassed several lakhs. Whatever the outcome of the Canton imbroglio, you have already become a richer man.

"While we dare not slander a gentleman like you, past facts seem to bear this out.

"Your reputation was anything but good during your incumbency of the Mayorship of Canton. When at Wu-Han, you swept into your pocket several lakhs of dollars collected by the Ministry of Communications on behalf of the Government.

"During the regimé of the Special Executive Committee at Nanking you abused your power as Minister of Finance in detaining *$1,100,000 worth of bonds appropriated to Li Jen-chao (Li Chi-sen)* and demanded a division of the spoils.

"You have not restored them up to now. Adequate evidence can be adduced in proof of these. The rumors now circulated about you, do not, therefore, seem to be entirely groundless.

"The Party and the State have been visited by repeated calamities during the past few years. But there has not been a political upheaval but your purse was replenished. The more frequent the disturbances, the more chances you got. That you would participate in the Canton rebellion and not let this opportunity slip by is what every one could safely have predicted."

Concluding, the signatories of the message say that Mr. Sun being the only son of the late Party Leader, they have respected and done everything to exalt him. They deeply regret to have to point out his shortcomings. However, they still entertain the hope that he will awake to his mistakes and strive for a peaceful settlement of the situation so that their hitherto cordial relations may be restored.

The nine generals whose names appear as signatories to the above are obviously adhering to the prescribed rules of Chinese etiquette. "*They do not dare to slander a gentleman like Sun Fo,*" but nevertheless there is no insulting epithet in the rich Chinese vocabulary of revilement that has not been employed to tell the world what they think about him. Now, if all this is true and Sun Fo's colleagues have held these proofs of his guilt while he was one of the privileged few, why was he not denounced and impeached in due legal form by the Control Yuan ? Why did his associates wait until he withdrew from their company, to accuse him of high crimes against the State ?

We hold no brief for either side in this dispute. The Nanking Government is not perfect. It is open to fair criticism on many counts. Yet with all its shortcomings, we hold to the belief that Nanking has to be supported morally and financially by the outside world as the only check to the spread of communism and the complete collapse of authority. There is no choice ; no alternative. It is either Nanking or Moscow. It cannot be Peking. The Northern militarists had their chance. Canton may do better than Nanking. It has good men, equally able as their Kuomintang associates in Nanking. But the line-up is suspicious. Its whole tendency is towards the Left and in some individual instances, their Leftism is too closely identified with Communism. No matter how brilliantly and convincingly the spokesmen for the new Canton government assert its complete independence of Moscow, it has taken advantage of a most inopportune moment to start another civil war. The provinces between Kwangtung and the Yangtze are overrun with communist armies. Nanking can make no move to invade Kwangtung without exposing its line of communications to communist attacks. For all practical military and political purposes, Canton is allied with the Communist forces, and for this reason alone its cause loses much of its appeal to otherwise open-minded foreigners.

The Canton group may have every justification for seceding from the dictatorship set up by Chiang Kai-shek. Canton presents a convincing argument in explanation of its revolt. It is difficult to judge of the merits of the dispute unless all the facts are disclosed, and though these are well known to the Chinese themselves, the truth rarely reaches the foreigner. It is not difficult however to visualize and understand the basic issue at stake, or is it overstepping the bounds of neutrality to express the opinion that until it is settled, China should stand together as one man under one leadership.

The circumstances call for a strong man, a dictator, a leader of armies, a determined fighter, a real he-man who can impose his views and will upon the other members of his government. He may use his position to enrich himself and his family ; he may even aspire to founding a new dynasty. Nearly every great dictator who has accomplished things has been guilty of the same political sins and has harbored the same ambitions. Chiang's job is to unite the country, suppress banditry and communism, consolidate the power of the government, establish law and order, and then, if he is real patriot, he will retire. If he takes a few millions with him it would be a very inadequate payment for his services.

If, during his dictatorship, he extracts a few millions from the treasury and fails to make a proper accounting or refuses to submit to an audit, it is wiser to say nothing about it until he has performed the task expected of him. If he is turned out, his successor will do the same thing until he, in turn, will incur the envy and hostility of those who are impatient to plunge their hands into the pork barrel.

It is quite understandable that Chiang Kai-shek should draw a few millions as he needs them from the Ministry of Finance and charge them to "extraordinary expenses" and it would be highly impolitic and embarassing for the other members of the government to insist upon knowing how the funds were expended. It is quite obvious, even to the outsider, that all these millions have not been salted away by Chiang or his family. Chiang has been called upon to pay out many millions to provincial generals, bandit and communist leaders and other gentry of the same ilk in order to purchase their allegiance. It would be difficult to exact a receipt for such disbursements. An audit would reveal that the great bulk of the moneys that have passed through Chiang's hands have been expended for the benefit of the government. Unless specific proof can be advanced to prove that all these millions have actually been diverted to Chiang's pockets, the allegations against his integrity are not worth a moment's consideration.

It is to be regretted by all well-wishers of China that Chiang has permitted his military understrappers to defend his character by impugning the honesty of Sun Fo, for if ever a boomerang came back to hit thrower a knock-out blow, it is the document signed by General Ho Ying-chin (the Minister of War) and eight of his army corps commanders. Instead of indicting Sun Fo, Nanking arraigns itself before the world as a government where no checks are placed upon the financial activities of any of its high officials, as long as they play the game according to the rules. Nanking accuses Sun Fo of failing to account for the twenty odd millions collected by his ministry from the various railways in the country and that his secession is simply a screen to enable him to appropriate these funds to his own use. This is highly interesting, but the accusation would carry greater weight in the minds of impartial observers if it emanated from any source other than the group of militarists who for years employed the railways for their own use and pocketed the revenues to defray the upkeep of their armies. The fact that their main source of revenues was cut off by returning the rolling stock and the lines to the Ministry of Railways, must be a sore point with these military gentlemen. That Sun Fo got as much as twenty millions out of these railways is highly problematical, but it probably represents rather accurately what the militarists consider they were bilked out of by surrendering the lines to the proper authorities. Nanking then proceeds to accuse Sun Fo of having appropriated to his own use several lakhs of dollars while he was a member of the Wuhan government and that he detained $1,100,000 of bonds which he still holds in his possession.

If these charges can be substantiated they may ruin Sun Fo's future in official life and destroy his usefulness as the principal in any future loan negotiations for the reconstruction of the country, but at the same time, they also impair the integrity of the Nanking Government. For, unless these charges are withdrawn or repudiated by some responsible cabinet official, the impression will be created that the present government is unworthy of financial credit or support.

Over seventy million dollars are owed to foreign firms for railway materials supplied to various Chinese governments. Several old established foreign firms have been forced into bankruptcy as a consequence of China's refusal to pay her legitimate bills. Many foreign holders of Chinese railway securities are waiting patiently for payments on defaulted interest. The debts of the railways are

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OUR SANCTUARY

An Atoll of Safety in an Ocean of Turmoil

It is to be hoped that Mr. Justice Feetham's report to the Shanghai Municipal Council on the future status of the settlement has not come too late to be of practical value. The sole justification for engaging the services of the eminent South African jurist was the promise held out that his recommendations would serve to unite the conflicting interests of the Powers concerned in a common program for preserving the settlement as a sanctuary until the turmoil and anarchy prevailing in the interior gives place to stability and security. It was obvious that no single Power would be permitted by the others to dictate a program for the solution of such a complex international problem. The initiative had to be taken by the Municipal Council in order to devise some plan that all the Powers could subscribe to and support.

Two years ago when the idea was conceived, there was a chance that an unbiased expert might find a formula that would meet the legitimate aspirations of the Chinese with due regard to the safety of the immense foreign interests centered in the Settlement. Too much water has run under the bridges since then, and it is now highly problematical if any plan short of absolute and immediate rendition will satisfy the Chinese. It is no longer a question of China's national honor and dignity involved in the recovery of Shanghai, but the more vital and pressing one of increased revenues to maintain the huge military establishment upon whose possession rests the power and prestige of National China, and which serves as the only bulwark against the capture of the port by the communist armies, waiting to swoop down and convert it into a shambles. If Chiang Kai-shek should meet with serious reverses in his present campaign, or is handicapped through lack of sufficient funds to carry through his offensive, the future status of Shanghai will not be long in doubt. We will once more witness a race between the foreign troop-ships and the victorious communists for the occupation of the port, with the odds on the Red. Anything may happen in China. The watchword of the Powers should be Vigilance, Preparedness and Security, for if foreign control over Shanghai is unduly weakened by handing over its administration to the Chinese until the major issue confronting the nation is definitely settled, there is little doubt as to who will be its future masters. It is all very well to discuss academically the length of the transition period before the International Settlement can be safely handed over to Chinese authority and in any such discussion the Chinese with their specious arguments and utter disregard for the realities of the situation will wear down the other side. The issue that confronts the Powers in Shanghai has absolutely nothing to do with whether or not the Chinese can be entrusted with the administration of the Settlement. It can be admitted for the sake of argument that they are eminently qualified to assume this responsibility. The real issue is whether Moscow is to triumph and use Shanghai as the capital of a Red China and a new Pacific center for spreading its doctrine of World Revolution, *Until this point is definitely decided, it is the height of folly to permit any impairment of foreign control or the undermining of the Settlement defenses. One or two reverses in Kiangsi, or a relaxation of vigilance in Chekiang, will bring the Red hordes pouring into Kiangsu, cutting off the port from the interior.*

Mr. Justice Feetham's report is a remarkable document, but its vital feature as far as it affects the main issues is the paragraph in which, referring to the length of the necessary transition period, he says : "*If an opinion were to be ventured now as to the minimum period required, it would be a question of the number, not of years but of decades.*"

The whole problem revolves around preserving Shanghai as an "island of security" a sanctuary, an atoll of safety in an ocean of turmoil. Foreign opposition to any immediate change in the administration of Shanghai is based squarely on the absence of any visible guarantees for security, whether for lives or property or for protection against the illegal acts of officials, military authorities or party organizations. This is clearly recognized by Mr. Justice Feetham in stating his problem before offering a solution.



Mr. Justice Richard Feetham

Outside of his recommendations as to the future government of the Settlement, Justice Feetham's findings are virtually the same as those arrived at by the International Commission that five years ago investigated China's fitness for the abolition of extra-territoriality. The indictment of China's unfitness to discharge her international obligations is the same in both instances. The first investigating body was composed of the official representatives of all the Powers concerned, whose nationals had every right to expect that these recommendations would serve as the basis of a common program for negotiating new treaties. Yet we have been compelled to witness the gradual scrapping of these recommendations in a pitiable and pusillanimous surrender to the clamor of Chinese Nationalism by entering into negotiations for the abolition of extra-territoriality long before China is prepared to assume her new obligations. These thoughts do not imply that we lack sympathy with Chinese nationalism or with the legitimate aspirations of the Chinese people. As a friend and counsellor of the late Sun Yat-sen, we have a deep appreciation of the principles he advocated and a loyal respect for his will and teachings. When the real menace that threatens the life of the nation is removed, and its government is in a position to discharge faithfully its obligations to the outside world, we will be the first to recognize that the time has arrived for the surrender of the Settlement and extra-territorial rights. We realize that National China resents criticism of its policies or program or any suggestion that it needs instruction of any kind, but we hold firmly to the belief that Dr. Sun's dream can never come true, if foreign prestige and control are weakened while the major problem remains unsolved. The Nationalist Government at Nanking was created and received its first support from the

foreigners for the express purpose of combatting communism. The only justification for this continued support from without has been to strengthen some one group that will free the country from Soviet influences and turn back the rising Red tide beating against the flimsy dykes in Chekiang and Kiangsu that protect Shanghai from loot and massacre.

We entertain little hope, however, that the faint-hearted statesmen who now direct world diplomacy will give any more attention to Mr. Justice Feetham's report than they did to the one drawn up by Mr. Silas M. Strawn.

There is very little left to the extra-territorial rights of foreigners in China to-day, and the constant nibbling at the foundations of Shanghai's autonomy has undermined its security. We would like to feel that the four great Powers chiefly concerned in the future stability of the Settlement, will come together in some joint understanding to carry into effect Justice Feetham's recommendations, but if the events of the past few years are any criterion of what we can expect in the future, it is hopeless to look for any unity or agreement.

On all sides there has been a reluctance to face the realities of the situation in China. The statement given out in Washington that the kidnapping, outraging and killing of missionaries bears no relation whatever to the principle involved in the abolition of extra-territoriality, fully reflects the changed attitude of the Western Powers towards China. The negotiations between Dr. C. T. Wang and the British Minister and those carried on in Washington between Dr. C. C. Wu and Secretary Stimson have destroyed any hope that Britain or America will adhere to the findings of the Extra-territoriality Commission. The policy of surrender and scuttle so clearly revealed in the published reports of these negotiations, indicates what we may expect when the question of Shanghai's future comes before the same group of statesmen for consideration.

China will approach the problem of rendition of the settlements in the same manner that she has undermined extra-territoriality, by notifying the Powers of her intention to take over the settlements and concessions in Shanghai, Hankow and Tientsin and the leased territories of Kwangchow-wan, and Liaotung, and in the discussions that follow, will establish her right in principle to assert her sovereignty.

Perhaps the future of Shanghai may be determined by the outcome of the negotiations for the rendition of the leased territories. It is noticeable that in the published reports of her recovery of rights program, China does not raise the question of the Kowloon lease, confining her demands to Kwangchow-wan and Liaotung. China is resorting to her traditional diplomacy of pitting one foreign nation against another ; soft-pedalling the issue of Kowloon in the hope that British sympathy will be with her against Japan in Liaotung.

Here is the real crux of the whole extra-territorial problem. Japan apparently is willing to accede to all of China's demands in so far as they apply to China proper, in return for the reciprocal right of residence in the interior, right to own and lease property, conduct business and operate industries on an equality with the Chinese. Nanking, however, takes the stand that these privileges cannot be extended to Japan as long as she retains her leasehold of Liaotung, and maintains her troops in Manchuria and her war-ships on Chinese rivers.

The Chinese placed on record at Washington their refusal to recognize the validity of the 1915 treaty, reserving to themselves the right to open the question at every opportune moment. This has become a cardinal principle of their diplomacy, that no statesman dare ignore and preserve his usefulness. In like manner, the validity of the 1915 treaty has become the corner stone of Japan's position in Manchuria and no Japanese statesman would dare discuss any impairment of these rights. Neither side can or will recede from their position, so we come to the stone wall, the jumping off place, where unless a compromise is found a clash seems unavoidable.

For Japan to surrender to the Chinese viewpoint and withdraw her troops in Manchuria, would simply result in making a present of the territory to the Soviet. The presence of Japan in Manchuria is the only check to the complete communization of North China and Northeastern Asia. It is not likely that Japan will budge from her position. Discussions may proceed between the diplomatic representatives of the two nations in order to arrive at a solution of minor questions, but both sides realize that sooner or later they must come to the stone wall and face the main issue, on whose solution depends the signing of a new treaty conceding reciprocal rights of residence.

It is too early to hazard any prophecy as to the outcome of this situation. For the present, the issue is squarely planted. If Japan and China refuse to recede from their position, the issue may have to go to arbitration to avert hostilities. It is almost a certainty that when China realizes that Japan will not accede to her wishes, another national boycott against Japanese goods will be declared. China will go to war with Japan, within the limits of the Kellogg-Briand Peace Pact and endeavor to ruin her opponent by economic pressure. The result will be exactly the same as though the war was fought openly with battleships, bayonets and bullets. China reserves to herself the right to use this economic weapon against any and all powers who refuse to accept her viewpoint and the Kellogg-Briand Pact fails to provide an answer to this type of aggression. To resort to secret economic warfare during the worst industrial and trade depressions of modern times, is tantamount to inflicting a crushing defeat upon the enemy, a blow that in the present difficult financial position of Japan might prove fatal. The question arises as to whether or not Japan can retaliate without arousing the hostility of other nations interested in China and who will benefit by her loss. This conflict cannot be averted except by taking the issue to an international court of arbitration, whose decision either way will be unsatisfactory.

With this picture before us, we see little profit in discussing the abolition of extra-territoriality or the rendition of the settlements until China and Japan arrive at some permanent solution of their problems.—G. B. R.

Active and Passive Diplomacy in China

It is now eight months since an American missionary and his Norwegian companion were captured by the Honan bandits. After the exchange of a few hundred letters between the American consular authorities and various Chinese civil and military officials, backed up with forcible demands of the State Department upon the National Government of China for the release of this American citizen, the Chinese bandit chief became so thoroughly overawed and submissive that he accepted $10,000 ransom money and released the Norwegian ! The citizen of the great and glorious Meikuo Republic, remains a prisoner.

It is so safe to kidnap, hold for ransom, maltreat and kill American citizens, outrage their women, rob them of their property and wealth, trample upon their treaty rights, sneer at their government and insult their flag, that it is no wonder the Chinese bandit chiefs muscled in on an easy and profitable racket. The Mexicans did it and when American citizens complained to a former Secretary of State, his answer was that " the State Department had other more important business to attend to than worrying about Americans who could not earn an honest living in their own country."

Under the Coolidge administration there was a return to a more positive policy for the protection of American lives and properties abroad. Honors were showered on the American consul and the naval officer who saved their citizens from massacre at Nanking. Americans in China were assured they had nothing to fear ; their government would protect them.

Policies change with administrations. Forced by the exigencies of depressed economic conditions, Hoover has reversed the policy of his predecessor. National dignity, honor, respect for the flag and other considerations that in the past would have been upheld by armed force, are now subordinated to the need for markets. The virile doctrines of " Silent Cal " have given place to a passive receptivity that will bring its inescapable sequel. When a positive nation assumes a negative attitude, the *passivos* become the *activos*. It has never been known to fail. The operation of this

natural law is being witnessed in China where an exhausted, decrepit and highly passive nation has been rejuvenated and galvanized into frenzied activity through the injection of universal peace serums, anti-war prophylactics and allopathic doses of nationalistic restoratives and communist nostrums guaranteed to make impotent states as virile as the most aggressive fighting Powers. The cancellation of the Anglo-Japanese Alliance purchased peace in the Pacific and handed Asia over to Russia; the Kellogg-Briand Pact assures peace in Europe at the sacrifice of European prestige and empire in Asia. Rampant Nationalism in China, protected against outside correction by the provisions of the Kellogg-Briand Pact, will gradually overcome the passive resistance of the so-called fighting Powers, only to be vanquished by a more bellicose nation which has declined to submit to an emasculating operation by universal peace specialists.

The old order is changing and the exact limits of our government's duty to protect its nationals in foreign lands is difficult to determine. In China, about all that can be done is to extend protection in such places as can be properly defended by warships. Americans who travel outside these restricted areas do so at their own risk. Secretary Stimson's first statement concerning Nicaragua was also intended to cover China and will probably be interpreted the same way in both countries; a confession of weakness and a recognition of China's superior military strength.

The Shanghai Evening Post recently printed an open letter to the Secretary of State bitterly denouncing Nanking for its failure to protect American lives and properties and strongly condemning the continued recognition of the National Government until such time as it could discharge its treaty obligations. Coming at a time when our foreign policy is being revamped it was a foregone conclusion that this appeal would fall on deaf ears. While the United States turns passive, Soviet Russia is planning to advance into China by industrial and commercial means, backed when necessary by force. Her experience in 1929 showed how cheap and efficient armed intervention was. It cost her practically nothing and no boycott was ever attempted in retaliation. Russia is the only Power which has increased her prestige and trade in China since 1929 and will continue to use the same formula to expand her present advantage. It will be highly interesting to watch the unfolding of these two divergent programs. The passivity of America may retain the friendship of China but active Russia will enjoy her respect and reap the material rewards.

Washington's attitude towards the open letter of the *Shanghai Evening Post*, was to the effect that there is no relation between the capture of American citizens by Chinese bandits and the question of extraterritoriality. Of course not. Neither is there any relation between the claims of Nanking to exercise supreme authority over the country and the realities of its position. It undoubtedly is sound politics to recognize Nanking as the government of China in order to hold some authority responsible for what goes on in the country, safeguard the continuity of diplomatic relations, settlement of foreign debts and carry out the other requirements of international intercourse, but it is folly to expect Nanking to reciprocate and discharge her treaty obligations. Nanking has all it can do to protect itself without wasting its time looking after careless missionaries and adventurous foreigners who voluntarily assume the risks incidental to residence and travel in the interior. The fact is that Nanking cannot exercise jurisdiction in any part of China outside the restricted Lower Yangtze area and even in these three provinces, bandit gangs raid, loot and commit outrages with impunity.

As long as the Powers adhere to their formula of preserving the territorial integrity of this vast country, obstruct its division into two or three independent states and insist upon recognizing one group as the supreme authority, negotiating treaties with its Foreign Minister covering territories over which it can never extend its jurisdiction, there can be no guarantees for the protection of foreign lives and properties in the interior of China. History tells us that when a government is incapable of exercising jurisdiction over all its territory, sooner or later, some other Power steps in and assumes the obligation.

Under present conditions there is no assurance that the National Government at Nanking can discharge its treaty obligations outside the Lower Yangtze area. Its answer to the establishment of the new Kuomintang Government at Canton is to disregard it and refuse to resort to arms to enforce its authority. This attitude is a recognition of Canton's independence and would be accepted as such by the Powers, if the antiquated formula of preserving intact the territorial integrity of the country to satisfy its creditors could be replaced with some equally practical program. At present, the international cement which holds the broken pieces of China together is the foreign directed Customs, whose revenues are pledged for the security of various foreign loans. Foreign governments will not officially recognize the belligerancy of Canton nor its status as a *de facto* government for fear of creating a new Chinese state that will impair the value of the security for their loans, but they recognize a *modus operandi* between Canton and Nanking whereby the integrity of the Customs is preserved under the foreign inspector general by securing that five per cent of the duties collected in Canton are remitted to Shanghai for loan purposes. The fiction of Nanking's supremacy is preserved, but Canton maintains its independence and collects the customs revenues. The same results might be obtained by officially recognizing the independence of Canton and entering into treaty relations with the new government on the condition that the southern provinces agree to set aside a percentage of the customs revenues to cover their share of the old national loan obligations. In view of Mr. Eugene Chen's caustic comments on the macaronic and Y.M.C.A. diplomacy of Nanking, it might be productive of good results if the Powers would decide to test his capacity for dealing with the problem of the unequal treaties in "terms of a more reasoned statesmanship." It would at least, help us to know exactly what we are up against in China if the Leftists, Reorganizationists, Communists and other disaffected elements gain control of the government. An independent Canton, struggling for recognition and support from the outside, might be willing to approach these questions in a much more equitable spirit than it would if it represented the whole country. It might be good statesmanship for the Powers to try it out.

If Nanking cannot properly discharge its treaty obligations, the American Government should concentrate its citizens in those treaty ports where it can discharge its duty towards them and their families. This is no time to sit on the fence and apply theoretical diplomacy to a situation that calls for positive action. Nanking is again with its back against the wall fighting for its life against a combination of foes whose triumph will consolidate the power of the Soviet throughout the land. If Nanking goes under, the passive policy of the Powers will result in their own undoing.

—G. B. R.

The Menace in Asia

China Arms While the World Disarms

It was not surprising that President Hoover took disarmament as the subject of his address before the International Chamber of Commerce and impressed upon the world leaders of finance, industry, agriculture and commerce the menace to world peace and economic stability involved in the continued maintenance of the huge standing armies which now exceed those prevailing before the World War. The problem of disarmament of land forces is uppermost in the mind of the President as one of the essentials to a return to normalcy. His ideas on the issue were clearly revealed on previous occasions when he squarely opposed American loans or credits to other countries for unproductive purposes. When requested to assist China to raise the loans to build a new system of railways, he wanted to know what progress was being made by Nanking in disbanding

its armies. He recognized that nothing could be done to help China as long as three million fighting men absorbed practically all the revenues of the central and provincial governments.

His address before the world's greatest business association is therefore of special interest to China and to those visionaries who believe that the American Government will take the lead in the financial reconstruction of this country. His message is therefore of paramount importance to the leaders of a country who advocate increasing the size of their already tremendous armies.

Mr. Hoover estimates at 5,500,000 the men actually under arms in the military establishments of the various nations, costing the taxpayers nearly $5,000,000,000 yearly. The reserves which could be mobilized in case of emergency, have an additional strength of 20,000,000. The grand total of all the standing armies of the nations of Europe, America and Japan approximate 3,500,000 men. Numerically, China's armies equal those of all the other nations of the world. The 2,000,000 bandits and communists organized into armies and bands preying upon the people, raise this total to approximately 5,000,000. These staggering figures carry their own story. "This vast armament," said President Hoover, "continues not only as a burden upon the economic recuperation of the world, but of even more consequence, the constant threats and fears which arise from it are a serious contribution to all forms of instability, whether social, political or economic." Of all the proposals for the economic rehabilitation of the world, President Hoover declares that he knows of none which compares in necessity or importance with the reduction of land armaments and sets great store on the success of the world conference on armaments scheduled to meet next February. Until this problem is brought under control, the threat is ever present that something may happen to once more start these millions marching.

As opposed to President Hoover's program for economic rehabilitation is Generalissimo Chiang Kai-shek's attitude towards disbandment in China. In an address to the entire national forces of the country on June 6, he said that it is erroneous to maintain that China to-day has too many soldiers; that in view of the vastness of the territory and the potential wealth of the country, the existing army cannot be said to be too much of a burden on the people. Indeed, according to General Chiang, if the governmental machinery of the country were running smoothly and the country's resources properly developed, the number of soldiers should be increased instead of being decreased. He added that all the talk about disbandment has been started to disturb the minds of the soldiers. "Such talk not only shows one to be totally devoid of a common knowledge of the revolution, but also proves one to be absolutely deviod of any national feeling" says General Chiang, adding that the Central authorities hold that the existing troops in the country need not be disbanded.

It is necessary to invite attention to the realities of a world problem, where the nations of the West are intent upon reducing the size of their armies as a means towards world peace and economic stability and the declared intention of the National Government of China to still further increase its fighting forces. China already maintains armies far in excess of the total fighting forces of the rest of the world, yet while other nations are seriously endeavoring to find a way to curtail their expenses and do away with this menace to world peace, the Chief Executive of National China, announces that his armies will not be disbanded, but increased!

The nations of the West may come to some understanding that will minimize the menace of war in Europe by a reduction of their land forces, but it can have no effect in Asia. In view of Chiang Kai-shek's pronouncement and the belief in its own military invulnerability and superior fighting prowess that already prevails in Nationalist China, it is difficult to see how Japan can safely impair her sole guarantees of national security. On the contrary, the constant pressure of Soviet Russia on the outlying provinces of China and her determination to bring China itself under the sway of Communism, not only justifies China in maintaining a huge army but forces Japan to watch closely her step. No real return to world economic normalcy is possible as long as China remains the goal of Communist ambition. It begins to look as though in pursuit of their own security, the nations of the West will enter into some new pact that will once more hamstring Japan by diminishing her power of resistance to forces that unless checked in time, will drag her down to economic ruin and political inferiority.

Any plan for world disarmament and economic rehabilitation that fails to bring relief to Japan is not only an injustice, but an invitation to that very disaster so clearly foreseen by President Hoover. There are many world problems that will engage the attention of the conference on the limitation of land armaments, but in our opinion the most vital and the most pressing is the one involved in the pacification of China, and the return of 500,000,000 people to their proper place in world economy. China cannot solve this problem by herself. We have recognized Nanking as the Central Government of a nation that duplicates within itself all the complex problems of pre-war and present-day Europe. Maintaining itself in power by sheer military force, alliances, subventions, armed truces, and other expedients, the National Government of the Republic of China will continue to function just so long as it can preserve the present balances of military power. Its stability and continued existence as the central authority depends entirely upon its ability to overawe the rest of the country by force of arms. To hold the country in subjecton, Nanking must do exactly the same as the Manchus did and quarter in the provinces huge armies of occupation.

As long as civil authority is subordinated to the military; until real democratic government deriving its powers from the consent of the governed is established in this country, China will remain a menace to world peace and stability. The issue cannot be side tracked or the responsibility for its solution indefinitely shirked by the rest of the powers. It is a world problem, one that can be successfully solved only by close international accord and co-operation. For unless, it is solved and quickly, China will drag the rest of the world down to ruin with her.—G.B.R.

Russia Will Dominate Asia

THE ANGLO-JAPANESE ALLIANCE, by Chung-Fu Chang, Ph.D. Published by the John Hopkins Press, Baltimore; Humphrey Milford and the Oxford University Press, London.

In an endeavor to prove that the Anglo-Japanese Alliance was a very wicked instrument designed for the spoliation of China, Mr. Chang Chung-fu has compiled a very interesting book for the uninitiated in Far Eastern history. He places to the credit or discredit of the Alliance during the twenty one years of its existence, "the Russo-Japanese War; the absorption of Korea by Japan; the Russo-Japanese rapprochement; the establishment and development of Japan's fivefold policy in China—economic exploitation, territorial expansion, paramount influence, political control and the "Asiatic Monroe Doctrine." The Alliance, he says, was concluded first to make a war possible, but like nearly every other Chinese writer on political history, he minimizes China's part in making the war possible and conceals the real reason for the Alliance.

Mr. Chang gives the full text of the two Anglo-Japanese Alliances but devotes only an incomplete paragraph to the secret treaty of May 1896 signed between China and Russia, the root cause of all the subsequent troubles in the Far East. He says that "though the text of the treaty was then unknown, the fact that a defensive alliance existed between China and Russia was an open secret." In the first place, it was not a defensive alliance, but provocative in the extreme. Neither was it an open secret, though the outward manifestations of its existence were so evident that Great Britain was compelled to take measures to protect her interests in Asia by entering into the alliance with Japan. Had the terms and objects of the secret Li-Lobanoff treaty which brought the Russians into Manchuria been even suspected in those days, nothing could have saved China from partition in 1898 or in 1900. Had Japan at Portsmouth the slightest idea that this treaty existed, China would have been called upon to pay an indemnity that would have lost to her forever the whole of Manchuria and part of Mongolia as well.

In those early years of the century, Great Britain was sore beset, pitted against Russia, France and Belgium, all seeking her undoing in Asia, and in this sinister combination, China became a silent partner. Great Britain stood alone, facing a coalition whose object was to reach the northeastern frontiers of India through China. Mr. Chang says that Great Britain resorted to the policy of compensation in the matter of concessions granted to other Powers by the Government of China, failing to understand that every move on the political chessboard was dictated by the instinct of self preservation in which the Open Door or spheres of interest played a very minor part. He fails to mention the reason why the British Government demanded these compensatory railway concessions nor does he refer to the ultimatum presented by the British Minister in 1898 to the Tsung Li-yamen when the latter committed a gross breach of faith in signing the Peking-Hankow Railway concession. The British Foreign Office telegraphed its Minister at Peking as follows :—

> " You are authorized to inform the Tsung Li-yamen that unless they agree at once (to the demands for compensatory railway concessions) we shall regard their breach of faith concerning the Peking-Hankow Railway *as an act of deliberate hostility towards this country, and shall act accordingly.* After consultation with the Admiral, you may give them the number of days or hours you may think proper within which to send their reply."

That ultimatum breathes the spirit of a Government thoroughly aroused and grimly determined to resort to instant hostilities against the Government at Peking for opening its doors so the Russo-Franco-Belgo combination could enter the Yangtze Valley and get that much nearer the coveted goal in India.

Mr. Chang does not tell us that Russia and her Allies never ceased their efforts to achieve their purpose and that they finally split China north and south and east and west with strategic trunk railways designed for her conquest. Nor does he mention that these railway intrigues finally brought the Russian Bear to the north bank of the Yangtze at Tungchow where he sat with his thumb on his nose twiddling his fingers at the discomfited Lion on the opposite side at Woosung, and that once more a firm British protest was necessary to remind the Waichiaopu that it was treading on dangerous ground. Few Chinese understand just why the terminus of the Lung-Hai Railway was shifted from Tungchow to Haichow.

Mr. Chang makes no mention of Japan's tremendous sacrifices in lives and treasure to preserve her independence once Russia was firmly established in Manchuria or that as a result of these sacrifices, China's sovereignty—somewhat impaired—was again restored over a region she had surrendered in order to make possible the war that followed.

He ignores the essential truth that during its life-time, the Anglo-Japanese Alliance was the one guarantee that China's sovereignty and territorial integrity would be respected. The alliance was scrapped in 1921 in order to placate the United States who believed that a war in the Pacific was inevitable and to satisfy those Britons who hoped the Great War would lead to a hard and fast understanding between the two great Anglo-Saxon peoples. The Four Power Pact which took its place brought peace to the Pacific but left Asia open to the comeback of Russia. The cancellation of the Anglo-Japanese Alliance removed the only effective check on Russia in Asia and as a consequence, the British hold on India is now almost finished. China retains her independence—in spots—but her outlying provinces are fast slipping under the control of Moscow. If Chiang Kai-shek fails in his present campaign, the outlook is gloomy indeed.

The Chinese and a few misguided sentimentalists may feel that the end of the Anglo-Japanese Alliance saved China from what Mr. Chang calls " Japan's five-fold policy " and for the sake of argument this can be admitted. But the Powers will yet rue the day when they permitted emotional hysteria to override common sense and practical diplomacy at Washington by scrapping a treaty with teeth in it for an innocuous old ladies' agreement that calls for a nice tea party and an old fashioned gab-fest when their insular possessions in the Pacific are endangered. War in the Pacific was averted at the cost of peace, security and empire in Asia. The price is being paid by every Power that attended the Washington Conference. Great Britain, who threw overboard her old partner to please America, has almost lost India, the cornerstone of her greatness and her empire. The Phillipines are demanding their independence and they will get it. China has lost Mongolia. Sinkiang will follow. China herself may become a full-fledged Soviet republic. Japan is slowly being forced from her position on the mainland and may revert to a second-rate insular power to be slowly strangled, impoverished and starved to death. *Russia will dominate Asia.*

There is another side to the Anglo-Japanese Alliance that has never been commented upon. The final balance sheet is yet to be drawn up. The price we have paid to date for discarding this guarantee of peace in Asia is nothing compared to what the future will exact.

G. B. R.

Amend the Immigration Law

It is gratifying to note that public opinion in the United States is swinging around in favor of extending the quota basis to Asiatics instead of applying to them the humiliating provisions of the exclusion act. We have never been able to understand why Congress persists in taxing the country to build up a huge merchant marine to foster trade with peoples it stigmatizes as inferior and undesirable. We erect walls to keep Asiatics out of the country and then spend hundreds of millions of dollars on building and subsidizing a Pacific fleet whose profitable operation is possible only by having the goodwill of the people we have affronted. We get away with it because we are strong enough to make it stick, but in so doing, have created a precedent that bodes ill for the future peace of the Pacific. The solution of the whole extraterritoriality problem in China and the right of foreigners to reside in the interior now hinges on the outcome of China's demands to apply the same discriminatory legislation to the nationals of other countries.

China will not object to the American exclusion laws as it is her fixed intention to apply the same restrictions, superimposed by all our discriminatory state legislation denying the right of aliens ineligible for citizenship to own or lease property, or to engage in specific lines of business. Americans expect to capitalize on their traditional political friendship with China, but under these conditions it is difficult to visualize any great future trade benefits arising from our surrender of extraterritorial privileges. China will repay Americans in the same coin that we have handed out to them in the past—and with compound interest.

In Japan, our exclusion law embittered the whole nation, and has given opportunity for jingos and flag-wavers to hold up America as the national enemy. In the recent book by Tadataka Ikozaki, entitled " Japan need not fear the United States," the author insists that war between Japan and America is inevitable, making capital out of the suppressed feelings of his people against the American exclusion laws which places the Japanese in a position inferior to negroes, Arabs, Filipinos and Latin Americans.

We owe a debt of honor to Japan and to China also. These humiliating restrictions should be removed, if we hope to gain the goodwill of people on this side of the world, who are now our best customers. The *Philadelphia Record*, inviting attention to this galling insult in connection with our splendid reception of the Japanese prince and princess says :

> **" Congress, limiting immigration, fixed restrictive quotas for all the countries but Japan. For Japan it decreed not a quota, but exclusion.**
>
> **" To make this discrimination worse, it did not represent a settled policy ; it was a hasty, angry gesture, retaliation for an awkward utterance by a Japanese Ambassador to this country. In a moment of petty exasperation Congress**

committed an act of deep offensiveness to a proud and sensitive friendly nation. And the affront rankles.

"The fine reception given the imperial party isn't worth a peanut unless and until Congress, when again in session, openly and handsomely makes amends to Japan by removing that dictate of exclusion, with its unpleasant and unavoidable implications of racial prejudice."

Mr. Wallace R. Farrington, former Governor of Hawaii also invites attention to the urgent necessity of undoing an error as the only means of building up goodwill and taking advantage of the trade possibilities in the Orient. He says:

"One of the necessities with respect to our national foreign trade in the Pacific area is that our country should, as soon as may be, place the countries of the Orient on a quota basis, the same as Europe," he said yesterday.

"Our country is well regarded in the Orient. The only fly in the ointment is the exclusion law. It might have been all right before we adopted the quota law, but now that we have a scientific exclusion law in the quota, there is every reason in the world why it should apply to all nations and wipe out a situation by which a few nations are singled out as 'backward,' and thus, in a measure, insulted when there is no necessity for it.

"If the Oriental countries were put under the quota law we would have, for example, about 100 Chinese immigrants a year and about 150 to 200 Japanese. That number each year certainly would not cause any great overthrow of the English-speaking race, upset our institutions or cause any economic friction.

"But, on the other hand, the elimination of the exclusion, the adoption of the quota and the recognition of these people on a basis of equality with other nations, as they should be recognized, will do a tremendous amount in promoting the goodwill and mutual respect on the basis of which business is built up.

"We are bound to think of this subject in these days when our business and contacts with the Orient are steadily increasing. Our trade with the Orient runs into the billions of dollars, and the percentage of increase of the trade in the Pacific area, including Australia and New Zealand, during the past fifteen years, has been greater than the percentage of increase of our trade with Europe or South America, taken as a whole."

Governor Farrington is right. We cannot expect the peoples whom we deliberately classify as undesirables to welcome our traders and ships with open arms and give us their business. It is not in human nature to accept meekly such an affront without making every effort to square the account.

In these days of trade depression and competition for markets, America needs all the goodwill and friendship it can gather. We cannot expect to do business with China on the strength of the outworn Hay Doctrine or our traditional policy of friendship, at a time when this country is asserting its independence and full equality with other nations.

There is no emotional interest in our exclusion laws either in Japan or China, but both nations are waiting patiently for Americans to rehabilitate themselves in the eyes of the Orient by substituting a nominal quota for our total exclusion, a graceful act on our part that would be a sentimental gesture without practical utility. If we insist upon carrying this discriminatory legislation upon our statute books, we might as well abandon all hopes of building up and retaining a commanding trade position in the Orient.—G. B. R.

Japan's Electric Light and Power Enterprises

By C. B. HIBBARD, Vice-President, Guaranty Company of New York

PROBABLY few, if any, people make more universal use of electricity than do the Japanese. It has been estimated that there are an average of 2⅓ electric lamps per household in Japan, and electricity is used extensively for industrial purposes and for transportation. The use of electricity for lighting is not confined to the metropolitan areas, but is to be found in almost every village, as well as in isolated farm houses, or sometimes more properly thatched huts, far removed from centers of community life. Practically all the industrial establishments in Japan use electricity for power. Important sections of the Government Railways have been electrified, notably the section of the main line from Tokyo to Yokohama, and extending from Yokohama westward some 35 miles to Kozu. The principal cities are, in addition, served by electric trolley lines, and of recent years there has been considerable extension of high-speed electric interurbans. In Eastern Japan these interurbans connect Tokyo and its port Yokohama, 15 miles to the south, and Tokyo and the national shrines in Nikko about 80 miles to the north. Similar high-speed interurbans run between Kyoto, the former capital of the Empire, and Osaka; between Osaka and the port of Kobe, and also between Osaka and Nara.

The National Government has under active consideration further electrification of its own railways, which to a certain extent compete with the privately owned interurbans. Transportation, however, is cheap in Japan, the Japanese love to travel, and there should be enough business to go around. Motor buses are being used more and more, but are still probably not an important factor in inter-city transportation, although in Japan, the buses have made substantial inroads into the volume of traffic handled by the urban trolley cars.

Steam Power vs. Water Power

About 60 per cent of the electricity in Japan is generated by water power. The percentage of hydro as *versus* steam power was higher in the earlier years of this century but it appears that in recent years the relative use of steam power has been increasing. The reasons for this are the increasing output of steam generating plants per pound of coal used, and also the fact that with increasing industrialization in Japan, there has been a seasonal change in the peak demands for power. Large factories, electric railways, and the use of electricity for household purposes have all combined to place a relatively increased demand during the winter months which is a season of low water. In the opinion of some Japanese engineers the increased efficiency of steam stations, together with the fact that the output of steam stations is always available while the output of hydro plants varies with the volume of water flow, should result in a more marked trend toward an increasing use of steam.

In relation to its area, Japan is richly endowed with water power sites. The reasons for this are the mountainous nature of the country, and the heavy annual fall of rain and snow. The rivers are relatively short and precipitous in their course. Furthermore, the rivers are in general not adaptable to navigation, and thus there is no serious problem presented in adapting the full utilization of water power sites to the needs of navigation. Rainfall ranges from a maximum average of 100 inches per year along the southern coasts to a minimum of 30 inches in the northern island of Hokkaido. In the United States annual precipitation is about 35 inches in New York, 33 in Chicago, 22 in San Francisco, etc. The heaviest rains in Japan are on the eastern and southern

slopes of the mountains on the main island of Honshu, but the more abrupt drop in gradient is on the northern and western sides toward the Japan Sea. Most of the larger power sites are located along the streams rising in this well-watered mass of mountains. The winter winds blowing out of Asia and across the Japan Sea carry snow which accumulates to great depths in these western mountains, and the melting of the snow in the warmer months gives to the rivers and streams of the western coast an evenness of flow that adds greatly to their value for water power.

Potential Water Power

Estimates as to the actual water resources of Japan have of course varied. An official survey completed in 1923 gives the potential water power available as 6,415,000 horse-power. A more recent estimate by the chief engineer of the Department of Communications listed the potential water power capacity at approximately 13,600,000 horse-power. (It is the Department of Communications, headed by a member of the Cabinet, that has such jurisdiction as the Government exercises over Japan's electric light and power industry). The former of these two estimates is probably very conservatively figured, and is given as the amount of power available should river and stream flow remain throughout the year at the low water mark. Naturally annual volume of stream flow varies considerably, one year as compared to another year. Furthermore, the minimum flow which usually occurs in February may be one-third or less than one-third of the volume obtained in the periods of high water.

Remarkable Growth of the Industry

Japan's electric light and power industry dates from 1886, at which time the Tokyo Electric Light Co., Ltd., was established with a capital of approximately $100,000 and served a total of 75 lights in the business district of Tokyo. Since that time the Tokyo Electric Light Co., the largest of the companies in Japan, has grown rapidly and to-day owns fixed properties valued by the Company in excess of $370,000,000. The Tokyo Electric Light Co., Ltd., is to-day one of the largest electric light and power operating companies in the world. Its annual output of more than 3,300,000,000 k.w.h. compares for example with about 4,200,000,000 k.w.h. annual output of Commonwealth Edison Co. of Chicago; 4,100,000,000 k.w.h. of the New York Edison Co. system; 2,400,000,000 k.w.h. of Detroit Edison Co. and 2,000,000,000 k.w.h. of Pacific Gas and Electric Company.

The growth of the electric light and power industry has been one of the truly remarkable phases of Japan's economic and commercial development. At the present time the properties owned by the industry are valued at some $2,000,000,000. Those properties include net works of transmission and distribution systems traversing the Empire, and an installed capacity of generating stations totaling about 5,100,000 horse-power. Power houses, either actually under construction, or whose construction is contemplated, will provide an additional 2,500,000 horse-power. Included in this latter figure are generating stations in various stages of completion, as well as power stations existing only on blue prints, and no doubt some projects that have not yet been reduced by engineers and draughtsmen to blue prints.

The period of greatest growth in the industry occurred in the years following the World War and up to say 1927 or 1928. For instance, between 1919 and 1928 total installed generating capacity increased 337 per cent, paid in capitalization 376 per cent, and total capitalization some 568 per cent.

Financing the Industry

Much the greater part, more than 90 per cent of the financial requirements of the electric power and light enterprises in Japan have been provided in Japan. But each of the so-called "Big Five" companies, namely Tokyo Electric Light Co., Ltd., Toho Electric Power Co., Ltd., Daido Electric Power Co., Ltd., Ujigawa Electric Power Co., Ltd., and Nippon Electric Power Co., Ltd., have sold one or more bond or note issues in the United States. Three of these companies have also been publicly financed by London. Bonds and notes of the "Big Five" now outstanding in the American market amount to approximately $136,400,000. During the deflation of security values that has swept through Wall Street these past 18 months, no group of foreign bonds selling on a yield basis comparable to Japanese utility issues, have stood up better marketwise than Japanese electric light and power company issues. In fact most of the dollar issues of Japanese utilities are now quoted at market values in excess of or near the initial offering prices.

These companies have demonstrated consistent earning power. The Tokyo Electric Light Co., Ltd., for instance, has paid cash dividends on its capital stock in each year since the company was formed 45 years ago. The bonded indebtedness of the industry as a whole is well secured by property values, and the ratios of mortgage debt to property values and earnings to interest charges are satisfactory.

Japan Self-sufficient in Manufacture

From time to time, and usually apropos of financial operations undertaken in America or in London, independent engineers have had occasion to examine the properties and installations of representative electric enterprises. Such engineers, including American, English and Swiss, have reported favorably as to the completeness and modern aspect of these properties and installations. A substantial percentage of the equipment used is of foreign manufacture, but more recent and present day installations are likely to have been manufactured in Japan. For Japan is to-day probably self-sufficient in the manufacture of generating equipment and electrical equipment in general. For instance, an electric lamp manufacturing company, largely owned and managed by Japanese and in which the General Electric Company is interested, is reported to have demonstrated an efficiency in the manufacture of electric lamps not excelled by any other lamp manufacturer in the world.

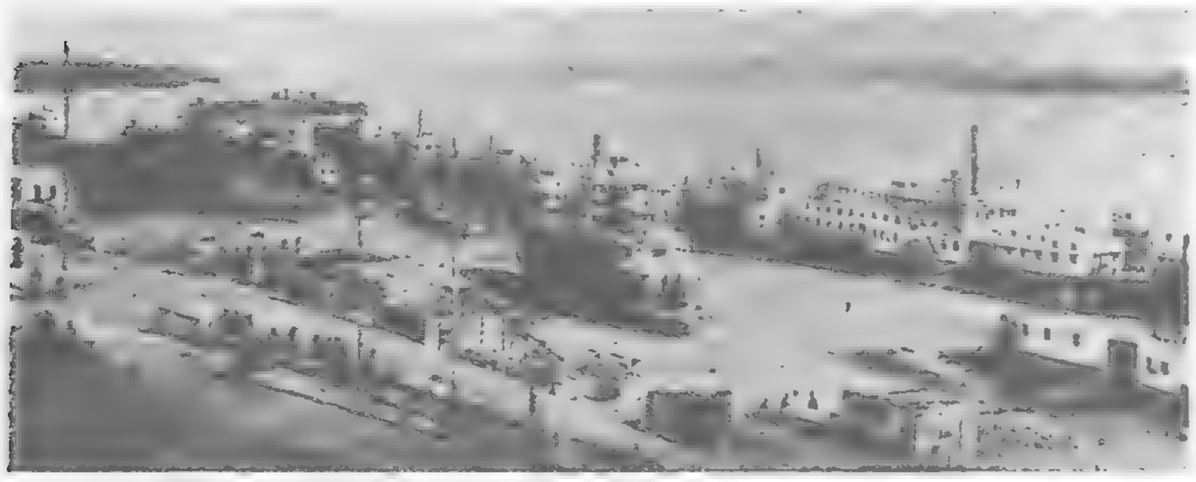
Of course direct comparisons of enterprises and statistics pertaining to one nation, and pertaining to another nation, are apt to lead far afield, but it is perhaps through such comparisons that a better perspective of conditions existing in the United States, and existing abroad, can be obtained. In the United States, utilities operate on the basis of a Government regulated monopoly. In Japan, utilities can function only through franchises and permits granted by the Government, but the Government has taken a less active part in regulating rates charged for services, or determining the relation between the utility and the public served, than do many public service commissions, or similar governmental agencies, in the United States.

Community of Interest

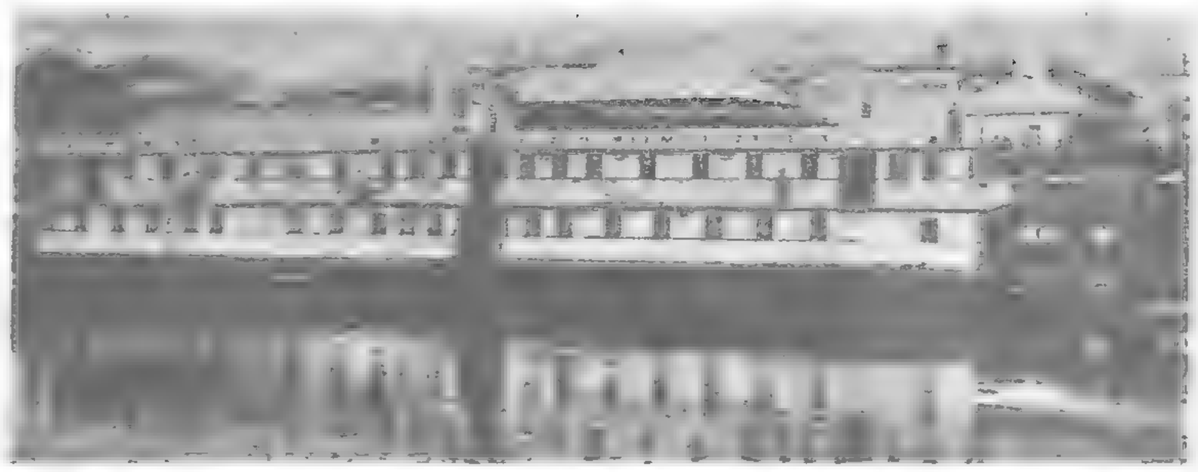
There is a very marked inter-relationship existing amongst the important Japanese electric light and power operators. This inter-relationship is evidenced by inter-company holdings of capital stock, and also by the fact that the larger companies buy and sell to one another substantial amounts of power. Furthermore, banking facilities in Japan, for companies operating in Japan, are largely concentrated in a few principal banks, and electric enterprises whose interests would perhaps otherwise be conflicting find themselves fed financially by the same banker. Thus, there has unquestionably been established a community of interest in the Japanese electric light and power industry, which is important in preventing undue aggression of one company against another. The Government has in the past granted franchises to different companies, which resulted in those companies being authorized to serve one and the same territory, with the result that there has been to a certain extent duplication of costly equipment. Of recent years actual competition has been sporadic in different territories, and the dangers of internecine competition probably more theoretical than actual. The Government has intimated that in principle it was opposed to granting further competitive franchises, but this principle does not yet seem to have been stated in the law of the land.

Settlement of franchises which have already been granted permitting more than one company to supply electricity to a given territory has been or is a matter of negotiation between the companies concerned. Unfortunately, negotiations in matters of this sort are apt to be preceded by a construction program entailing substantial outlays of money. Partly as a result of this procedure, the electric light and power industry in Japan may be to-day overbuilt, at least temporarily. Already most of such

(Continued on page 358).



The Quay at Blagoveshensk



Type of Shallow Draft Passenger Steamer on the Amur

Amur and Sungari Navigation

By F. H. BERT

One of the questions which will probably be discussed at the Sino-Soviet Conference in Moscow is that of the navigation of the Sungari and Amur rivers and more particularly the Amur which for a considerable distance marks the border between China and Russia.

Having resided many years on the Amur, the writer of this article is probably one of the few men living who has particular knowledge of Amur navigation, documents and statistics on which were destroyed during the first days of the Russian revolution.

Before the opening of the Siberian Railway European Russia had little information regarding the lower reaches of the Amur and the whole of the region was considered more as a place to which to send political criminals rather than a country which could bring profit to the government.

About the year 1885 an Englishman named Clark conceived the idea of navigating the Amur and bought a paddle steamer for the purpose of trading up and down the river. Few facts can now be gleaned about his business, but it is known that he had an office in Vladivostock and that he built warehouses at Nikolaievsk on the Amur which were still standing in 1915, though the original owner had been dead many years. Locally these warehouses were called Dickenson's Stores but who Dickenson was, no resident of the town could remember.

The opening up of trade on the river attracted the attention of adventurers and it was not long before the wonderfully rich goldfields, afterwards named the Ochotsk Gold Mining Company, were discovered, attracting still more people to the district.

The Russian government awoke to the possibilities of the Amur river and a Shipping Company, called the "Amur Steamship Company" was formed. The first steamers had British machinery and were brought out from England in sections. Year by year the trade increased, many gold mines were opened, large fisheries started and many settlers arrived from European Russia, forming villages on the river bank. Some of these were German colonists from the Volga who could hardly speak Russian. Curiously enough the rapidly growing town of Nikolaievsk was not recognized by the Petersburg government and the port of the Amur up to 1914 was the village of Mago, about 20 miles further up the river, owing to the Amur Shipping Company erecting large warehouses there.

The increase of trade brought more demand for shipping and several new companies were formed, the most important being the "Bistrohod" which owned two splendid passenger boats built at the Sormovo Works in Russia and brought out in sections. These two boats *Kanavino* and *Lux* were managed by Merkuloff (of Vladivostock notoriety). The agent at Nikolaievsk was B. Hayton Fleet and, at Habarovsk, S. Pickersgill, both British subjects.

In the year 1915 the then Governor-General of Eastern Siberia Mr. N. L. Gondatti, came to Nikolaievsk and officially opened it as a port of the Russian Empire. By this time, owing to the strenuous efforts of P. P. Krinin, Town Mayor, and B. H. Fleet, one of the leading merchants of the town, great warehouses had been erected for the purpose of increasing trade, and more especially for transit business in wheat and beans from the Sungari.

At this time there were few Chinese steamers on the Sungari, the bulk of the river traffic being carried by the steamers and barges of the Chinese Eastern Railway, while steamers belonging to Russian owners on the Amur sailed up to Harbin with Amur fish and brought back grain, cakes and oil from Harbin to Amur river towns. Steamers flying the Russian flag carried goods from Sungari to Amur towns, irrespective of their being Russian or Chinese, and also carried goods from Chinese towns on the Amur bank to Russian towns situated down the river, and some Chinese vessels sailed from Harbin to Habarovsk and from Harbin to Blagovestchensk.



Types of Amur River Steamers

The Great European War had its effect on Amur navigation as many goods were shipped from foreign countries to the interior of Russia *via* Nikolaievsk.

Japanese interests saw the possibilities of the Amur and bought several steamers under the Russian flag, hoping to get permission to navigate them on the Amur, but all their efforts in this direction were unsuccessful and finally they sold these craft to the Chinese.

At the same time Chinese merchants in Harbin commenced purchasing Russian

steamers and thus formed the nucleus of the Sungari shipping fleet.

The official opening of Nikolaievsk as a port of the Russian Empire drew the attention of exporters in Harbin, and in the autumn of 1915 the Danish firms of Wassard & Co. shipped a steamer cargo of soya beans from the lower reaches of the Sungari in Russian barges to Nikolaievsk, where an ocean steamer was ready to take the cargo to Europe. In 1916 several other firms shipped beans and wheat from the Sungari to Nikolaievsk and thence to Europe, while quite a number of Japanese vessels loaded beans, beancake, wheat and oats for Japan. All these goods were brought to the port by Russian river vessels which navigated the Sungari up to Harbin.

Steamers flying the Chinese flag did not sail further north than Habarovsk during the years 1915 to 1918 and before that there were no Chinese owned river boats. Some of the newest and largest steamers on the Amur including the very powerful *Ivan Oparin* were bought by Chinese and transferred to the Sungari, but while sailing on the Amur they flew the Russian flag.

The occupation of Habarovsk by Soviet troops and the intervention of foreign forces interfered with navigation on the Amur in 1917, and in 1918 a number of Russian owned steamers fled into the Sungari where they were afterwards sold to Chinese merchants. As during the time that Krasnotschekoff was in power at Habarovsk there was little traffic past the town and Nikolaievsk was running short of stores. Fleet sent his powerful tug, towing barges, up the river under the British flag and she was allowed to pass. Reaching Lahasusu on the Sungari she loaded wheat, flour, beancakes and oil and returned to Nikolaievsk, towing six large barges. In 1919 the first large Chinese steamer towing several barges arrived at Nikolaievsk from Harbin. She flew the Chinese flag for the whole voyage and took back a large shipment of fish and many Chinese laborers. The Amur Shipping Company was still running under the old Russian flag as there was a Siberian government in power, but in the late autumn of 1919 most private owned vessels escaped into the Sungari.

In the Spring of 1920 the Trepitzin gang of some 5,000 men destroyed the town of Nikolaievsk and massacred about 3,000 persons including over 700 Japanese. They destroyed many small craft, all landing stages and warehouses and thus navigation on the Amur was stopped. The two finest steamers on the river *Kanavino* and *Lux* were burned and gutted, while many others were also destroyed.

Up to 1923 a number of steamers under the old Russian tri-color flag sailed from Harbin to Sakhalyan and several steamers flying the Chinese flag sailed from Harbin to Habarovsk, but the advent of Soviet troops for the purpose of capturing Vladivostock stopped all this trade. The only steamers left were a few of the former Amur Shipping Co. now called the Soviet River Fleet.

On the signing of the Sino-Soviet agreement all navigation, excepting that flying the Soviet flag, was entirely stopped, though steamers flying the Chinese flag plied between Harbin and Sakhalyan on the Chinese side of the Amur, never calling at any port on the Soviet side.

If the Sino-Soviet Conference comes to an agreement regarding Amur navigation, it is possible that the Chinese flag will again be seen at Soviet terminal points on the Amur and Soviet vessels at Harbin. It seems absurd to carry grain from the lower reaches of the Amur and Amur Chinese towns to Harbin and thence despatch it by rail to the sea coast, when it is a stone's throw to Habarovsk and thence rail to Vladivostock, or cargo may be shipped by river to Nikolaievsk where ocean steamers can be loaded, such freight being of course much cheaper than by rail.

Nikolaievsk being a northern port, shipments can only be made during the months of June, July, August and September and only provided there are plenty of barges to carry the grain outside the river bar to ocean steamers as no vessel over 16 feet draught can cross the mouth of the Amur. In former days ocean steamers loaded grain up to 16 feet draught at Nikolaievsk and filled up outside the bar from barges. Plans were formulated to dredge the mouth of the river but these were never started owing to the revolution. At Nikolaievsk itself the river is more than 30 feet deep and all ocean steamers could load there provided the river bar was dredged to a suitable depth.

The project of a sea canal from Sofisk on the Amur to De Kastre Bay on the sea coast at one time met with great favor and would undoubtedly have been carried out but for the change in the Russian government. By such a canal Amur river steamers and barges would have been able to reach the sea without the dangers of the storms prevalent at the mouth of the Amur, while ocean steamers would have had no difficulty in anchoring in De Kastre Bay where there is deep water to the side of the cliff and a natural harbor entirely free from storms of any kind, the high rocky islands at the entrance to the bay keeping off all winds.

The navigation at De Kastre opens a month earlier than at Nikolaievsk and all goods reaching the bay in the late autumn could be shipped without danger of ice.

This scheme was promoted by the late P. P. Krinin, the energetic Mayor of Nikolaievsk who afterwards became head of the Amur Waterways, holding this position until the Soviet government became master of Eastern Siberia.

Such schemes as loading of grain from the lower reaches of the Sungari and Chinese towns on the Amur for points on the Russian sea-coast for export abroad, must of necessity not meet with the approval of the Chinese side of the Chinese Eastern Railway Board, as every ton of grain shipped by such a route is a loss to the C. E. R., though a gain to the consumer in the matter of freight.

The question thus resolves itself into how to reconcile the interests of Soviet Russia and China, and this is one which must be discussed in the near future.

If an agreement were reached by which the Chinese flag could carry Chinese goods to Soviet Amur ports and the Soviet flag could carry Soviet goods to Chinese towns on the Sungari, this might probably solve the matter in a manner satisfactory to both countries.

No matter how the question of navigation of the two rivers may be solved, there is no doubt that the C. E. R. must lose a part of its grain freights, and this is one of the greatest stumbling blocks in the settlement of the matter.

The Amur is a river which is navigable for a distance of about 2,000 miles and it is the natural outlet of Manchurian products to the sea, water freight being always cheaper than railways, therefore for the purpose of developing trade some arrangement should be come to as regards its navigation.

Siamese Railway Schemes

According to advices recently received by the Department of Overseas Trade in London from Mr. J. F. Johns, H. M. Consul-General at Bangkok, under the caption of "Economic Conditions in Siam," considerable attention is being paid to railway construction in that country. In the booklet on the subject, which has been published by H.M. Stationery Office, Mr. Johns states that the north-eastern line, namely, that from Korat to Warindr, has been completed, the final section from Srisa Kesa to Warindr, a distance of 60.61 km. having been opened to traffic on April 1, 1930.

It is not at present intended to extend this line beyond Warindr, which is on the river Me Moon, a tributary of the river Mekong. A road is, however, being constructed from Warindr to Pimool, from which place there is already a motor road *via* Chong Mek to the Mekong. The first section of the Kon Kaen Line, from Tainon Chira (near Korat) to Nohn Wat, a distance of 29 km., was opened to traffic in May, 1929. From Nohn Wat to Kon Kaen, a distance of 156 km., the line is still under construction. In March last two extensions to this line were sanctioned, from Kon Kaen to Nong Khai, a distance of 170 km., and from Kon Kaen to Nagor Panom, a distance of 229 km.

The survey is to be completed within two years, and, provided nothing unforeseen occurs, it is expected that both lines will be opened to traffic by 1937. Both Nong Khai and Nagor Panom are on the river Mekong, the former being close to the French Laos center of Wieng-Chan, and the latter almost opposite Thakek, whence there is a road to the Gulf of Tongking.

The electrification of portions of the State Railways is still under consideration and a Swedish expert firm has been engaged on a three year contract to go thoroughly into the question. No immediate decision in this matter is, therefore to be expected. The total length of State Railways open to traffic on September 30, 1930, was 2,923 km.



Front Elevation of Mayor's Building, Central Structure of Civic Center for Greater Shanghai

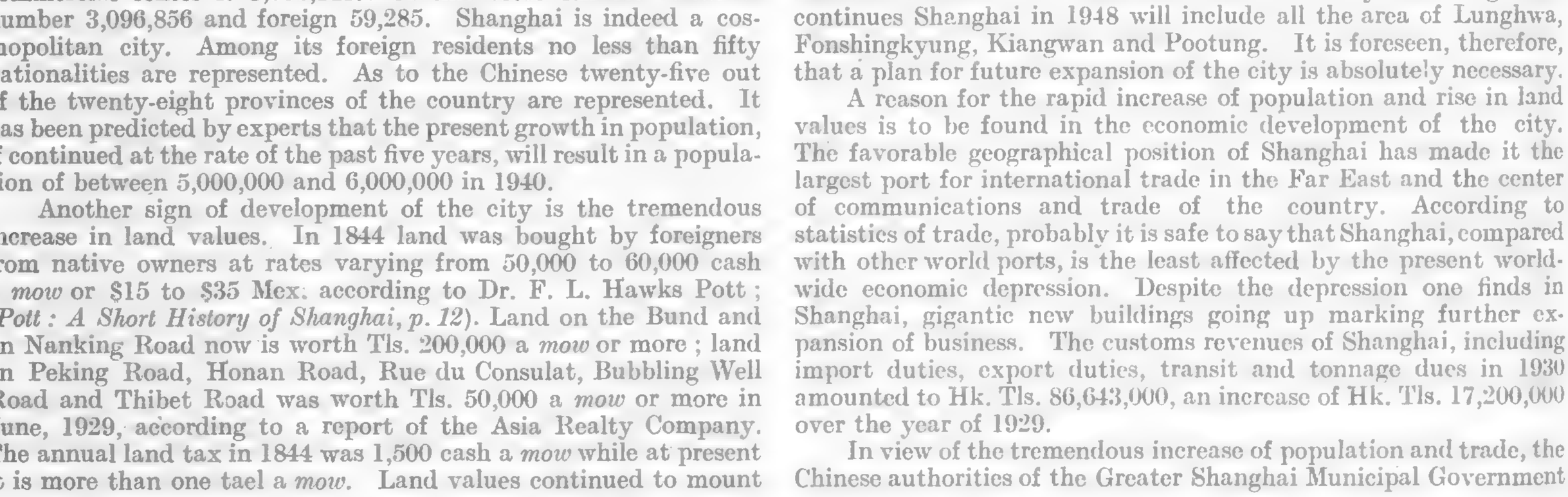
Building a New Shanghai

With a population of more than three million, Shanghai is the largest city in the Far East and the fifth in the world. Based on the latest census returns taken by the authorities of the Municipality of Greater Shanghai, the International Settlement and the French Concession, the number of residents, Chinese and foreign, within the limits of this great commercial center is 3,156,141. Of this total Chinese residents number 3,096,856 and foreign 59,285. Shanghai is indeed a cosmopolitan city. Among its foreign residents no less than fifty nationalities are represented. As to the Chinese twenty-five out of the twenty-eight provinces of the country are represented. It has been predicted by experts that the present growth in population, if continued at the rate of the past five years, will result in a population of between 5,000,000 and 6,000,000 in 1940.

Another sign of development of the city is the tremendous increase in land values. In 1844 land was bought by foreigners from native owners at rates varying from 50,000 to 60,000 cash a *mow* or $15 to $35 Mex. according to Dr. F. L. Hawks Pott; (*Pott: A Short History of Shanghai, p. 12*). Land on the Bund and on Nanking Road now is worth Tls. 200,000 a *mow* or more; land on Peking Road, Honan Road, Rue du Consulat, Bubbling Well Road and Thibet Road was worth Tls. 50,000 a *mow* or more in June, 1929, according to a report of the Asia Realty Company. The annual land tax in 1844 was 1,500 cash a *mow* while at present it is more than one tael a *mow*. Land values continued to mount in 1931 to a remarkable degree. According to a map showing the growth of Shanghai prepared by the Asia Realty Company, Shanghai of 1908, outside of the native city, was bounded by the Bund, by Soochow Creek, on the north, and Thibet Road, on the west. In 1928 all the districts of Chapei, the French Concession and Hongkew had developed into prosperous business, industrial and residential centers. It is estimated that if the city's rate of growth continues Shanghai in 1948 will include all the area of Lunghwa, Fonshingkyung, Kiangwan and Pootung. It is foreseen, therefore, that a plan for future expansion of the city is absolutely necessary.

A reason for the rapid increase of population and rise in land values is to be found in the economic development of the city. The favorable geographical position of Shanghai has made it the largest port for international trade in the Far East and the center of communications and trade of the country. According to statistics of trade, probably it is safe to say that Shanghai, compared with other world ports, is the least affected by the present world-wide economic depression. Despite the depression one finds in Shanghai, gigantic new buildings going up marking further expansion of business. The customs revenues of Shanghai, including import duties, export duties, transit and tonnage dues in 1930 amounted to Hk. Tls. 86,643,000, an increase of Hk. Tls. 17,200,000 over the year of 1929.

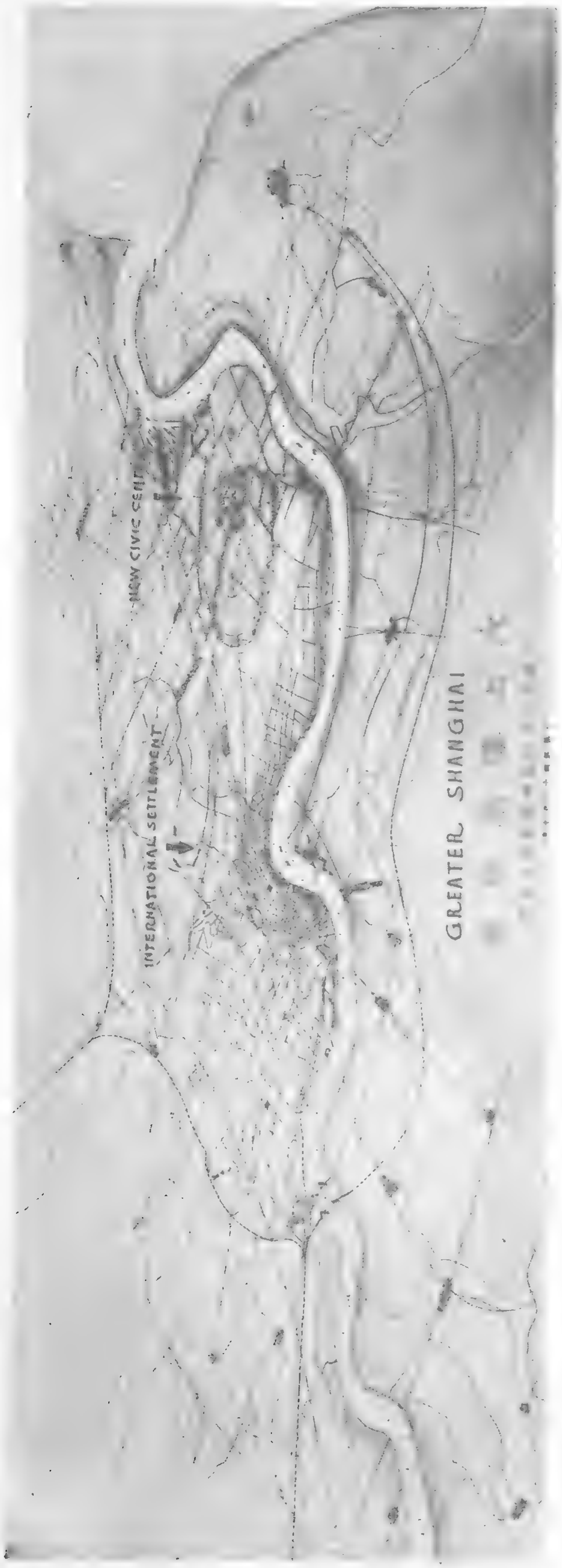
In view of the tremendous increase of population and trade, the Chinese authorities of the Greater Shanghai Municipal Government



Rear Elevation of Mayor's Building

have devised plans for the building of a new city. The City Planning Commission, which is headed by Dr. Shen Yi, a Municipal engineer, with the counsel of Mr. Dayn Doon, an architect, was organized in 1929. Following almost two years of comparative study with technical advisors, including Dr. C. E. Grunsky of San Francisco, Mr. A. E. Phillips of Washington, D. C., and Professor Hermann Jansen of Berlin, the Commission evolved a detailed program for the building of a new Shanghai, work on which has been started. The site chosen for this great project is the Kiangwan district, conveniently located between Woosung and the International Settlement. It reaches the Whangpoo River on the east and the Shanghai-Woosung Railway line on the west. The entire





site comprises well over 100,000 *mow* of level ground. The Civic Center will be centrally located occupying approximately 3,000 *mow*. With respect to transportation and communications a better site could not be found.

The idea of developing the district near Woosung and Kiangwan as a future world port dates back more than thirty years ago when Liu Kun-yi was Viceroy of Kiangsu Province. It was thought that the logical development of the port of Shanghai would eventually move from Yangtszepoo northward, that factories and plants would rise in the district near Woosung, and that business and residential development would follow. In 1927, Shanghai became a special district by order of the National Government at Nanking. The City Government of Shanghai was then established. To Shanghai's first Mayor, Huang Fu, is due the credit of reviving the idea first conceived more than thirty years ago.

The next Mayor, Mr. Chang Tin-fan, gave new support to the idea. It was not until the inauguration of the present Mayor, Mr. Chang Chun, that definite steps were taken for the realization of the scheme. Although it has been customary in China for successive administrations of any given area to replace important staff members whenever a new chief was installed, the City Government of Shanghai has departed from this old custom and therefore most of the technical men who have been engaged in the city planning work have been able to carry on through the administrations of three mayors.

The dominant feature of the new city will be the Civic Center, which is to be an example of " Chinese Renaissance " architecture. It will rise at the intersection of two principal thoroughfares. The Mayor's building will be placed in the center, flanked by nine bureaux. The east-and-west axis will be a 60-meter-wide boulevard running eastward from the new railway station to the river. The north-and-south axis will be another 60-meter-wide boulevard running north and south and forming the principal approach from the present International Settlement on the south. In front of the government buildings the vast area will be given over to a plaza. The Civic Center will be embellished with gardens, monuments, pools, fountains, bridges and the like, the whole to form, with the future courthouses, museums, art galleries, auditorium and post-office, a monumental and beautiful ensemble. The concentration of government buildings in one district certainly promotes efficiency and facilitates the conduct of municipal affairs, at the same time adding to the dignity of the city.

Under the supervision of Dayn Doon, chief architect of the City Planning Commission, erection of the Mayor's building is being begun. The cornerstone of this building will be laid on July 7, which marks the fifth anniversary of the establishment of the City Government of Shanghai. The Mayor's building is to comprise four storeys, 102 feet in height. Its length will be 310 feet and width, 80 feet. The floor area of the building will be 85,000 square feet and the building will cover 25,000 square feet. The structure will be built in reinforced concrete and steel. Its exterior, in Chinese style, will include all the details of Oriental beauty in architecture. Artificial stone, dark red columns, polychrome beams and brackets and gray tile roof will enrich its charm. Heating, sanitation and elevators will add to modern conveniences. The ground floor will be composed of an entrance hall, waiting rooms, offices, safety deposit vault, a dining hall and a kitchen. An auditorium, a library and conference rooms will be on the second floor. On the third floor will be the Mayor's office, reception rooms and staff offices, store rooms and servants' quarters will be on the attic floor. The distance from the Civic Center to Sassoon House, located on The Bund in the heart of the International Settlement, is approximately four miles.

In addition to the Civic Center, the City Planning Commission has allocated districts for residential, industrial, commercial and educational uses. Considerable attention is being given to development of the harbor. Although known as the greatest port of the Far East, Shanghai has much to do to improve docks and wharves with warehouses and shore communications. Woosung district offers an ideal site for port development. With its miles of water frontage having more than 35 feet depth near the shore, vessels of all sizes and description will have no difficulty in finding accommodation. Wharves, warehouses and water-frontage will be built according to the most modern designs and such confusion and unsightliness as exists to-day along the waterfront will be eliminated.

Railway transportation will be linked directly to the wharves so that unnecessary delay and expense may be avoided. While

SHANGHAI GROWS

ASIA REALTY COMPANY
FEDERAL INC. U.S.A
1928



the district lies in the extreme north of the new site, it is at the same time easily accessible by several trunk highways from the central district. Although railway transportation is not included in the scope of the city planning, it is obvious that it is one of the important items to be considered. Certain modifications of existing lines will be effected. Chen-ju, a small town located north-east of the International Settlement, will be made a railway junction. From Chen-ju four lines will radiate. To the east all passenger trains will be brought into a new station on the western side of the city. To the west will be the Nanking-Shanghai line ; to the north will be the Shanghai-Woosung line and to the south will be the station and the Shanghai-Hangchow line. From Lunghwa a line will be built to cross the Whangpoo and extend northward to a point opposite Woosung. A net-work of main arterials is carefully laid out, providing for the relief of overloaded routes and a free movement of traffic between the various centers so that business of the district may be carried on without the handicap of inadequate communications.

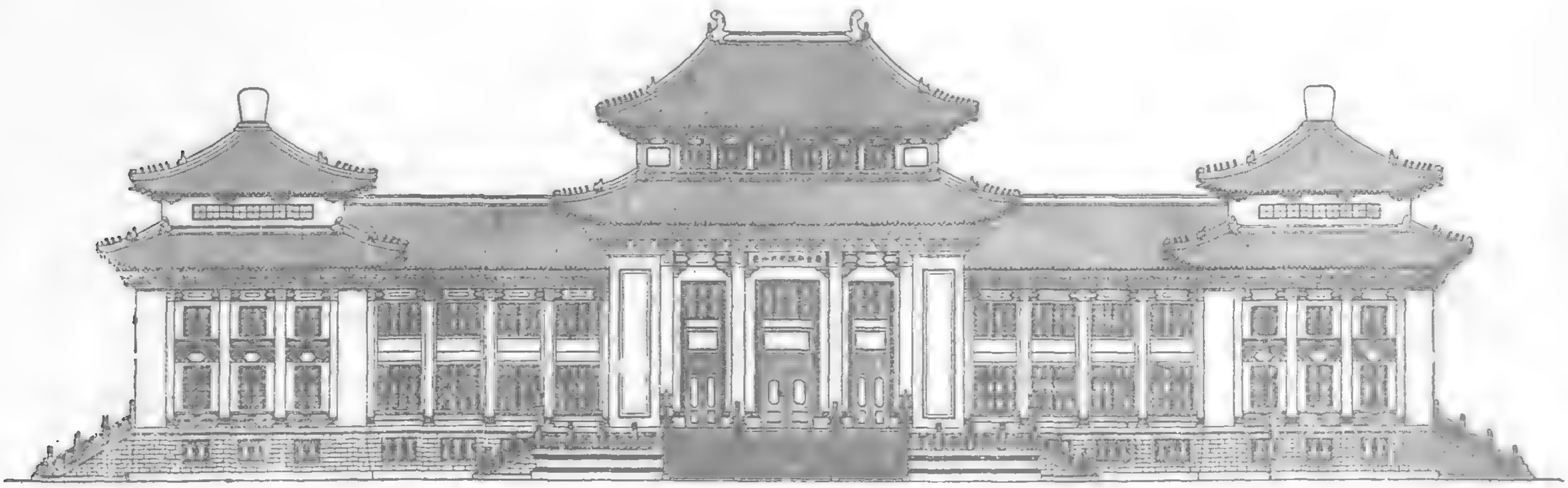
A bridge across the Whangpoo River is to be built. The proposal for the construction of such a bridge is not a new thing. A group of prominent business men of the city met on November 22, 1930, under the auspices of the City Government of Greater Shanghai to discuss the project of building a steel bridge across the river. It was reported at that time that plans had been prepared to construct a bridge of 1,800 feet in length at a cost of $5,000,000 to be located in the Nantao section of the city. It was also suggested at the meeting that necessary materials for the bridge should be obtained from two German firms either on credit or on instalment terms. The whole project, however, is still in abeyance. In the meantime, the Shanghai-Pootung ferry service is being enlarged to meet present needs. The first steam ferry of this service was launched on November 10, 1929, by the Bureau of Public Utilities of the City Government. In the early part of last December three more steam ferries were placed in service between the Nanking Road Jetty and Yongkow, Pootung. These boats are on a full schedule of 12 round trips daily. It is reported that three more vessels capable of accommodating cargo, motor trucks and vehicles will be placed in service. These ferries have a passenger capacity of 20 in the special class, 120 in the first class and 180 in the second class.

Road building is another item in the planning of the new city. The streets are so located that they intersect mostly at right angles. Standards suggested for the width of streets are : boulevards, 60 meters, main arterials, 30 meters ; ordinary streets 25 meters, and minor streets 20 meters. The orientation of the street blocks has also been considered. With the exception of the limitations fixed by existing main roads, blocks will run east and west, so that generally buildings will face either south or north. In the residential district, circumferential, or ring streets, will be introduced. They will not only create a picturesque effect, but will also reduce through traffic. " One-way " routes and the " gyratory " system, both of which have proved useful in cities of Europe and America will be adopted. The gyratory system is necessary at public squares or circles to allow a smooth flow of traffic from one street to another.

Special attention is being given to the question of housing which is fundamental to city planning. Housing regulations will be modelled after the best existing examples with reference to special local conditions. To replace the numerous bamboo huts occupied by the poor—reported to be 21,000 in 1929—the City Government is to build a system of Municipal tenement houses. Dr. Hsu Pei-huang, Commissioner of Education, has been acting as chairman of the committee for the construction of these houses. The sum of $20,000 was raised by the City Government for the construction of the first block of these houses off Chuan Chia An Road in the western district. The first block was completed in 1929 and dwelling units were let at a rental of $2 a month. Plans for the second block of these tenement houses have been prepared and it is expected that construction work will be commenced soon. The City Government has also drawn up schemes which provide for the allocation from the treasury of $100,000 and the raising of $500,000 from various charitable institutions for the construction of 5,000 " model " tenement houses in Shanghai, 1,500 at Tan Tz Wan, Chapei ; 500 off Paoshing Road, Chapei; 500 at Lan Nee Doo, Pootung ; 300 at Shih Hui Kong, Nantao, and 200 off Chuan Chia An Road, western district. It is estimated that $1,300,000 will be needed for the purpose.

A complete and well distributed system of parks and open spaces is contemplated by the City Planning Commission. The several waterways averaging 40 feet in width are, in their present condition, unsightly and unwholesome. It is planned to improve the flow of water and convert the shores into beautiful parks. The Whangpoo river shore area is to be transformed in a manner like that done along the banks of the Hudson River on Manhatten

(Continued on page 366).



The New Civic Center of Canton

Canton—A World Port

At this time when another upheaval in the national life of China has brought Canton into the focus of public attention it may be interesting—disregarding political aspects—to take stock of the things that have been achieved in the southern Capital. From any viewpoint the record is arresting.

For more than twenty-five centuries Yang Chen, the City of Rams in its classical designation, ninety miles from the sea on the historic Chu-kiang or Pearl River, remained merely a large Chinese city, possessing nothing to differentiate it from other Chinese cities. Through the centuries it unfolded its history after the manner of the age-old standards, untouched by influences from the outer world that were brought, first by Arab travelers, and, later, in the fifteenth and sixteenth centuries, by Portuguese, British and Dutch traders.

Canton remains a Chinese city completely under Chinese rule, but two decades have seen a mighty metamorphoies. Judged by modern concepts more progress has been made in Canton within the past twenty years than in the preceding twenty centuries. The city to-day with upwards of a million inhabitants challenges attention as a world metropolis.

As the birth-place of the revolution which ended the Manchu regimé and brought the Chinese Republic into being Canton only entered into the new era of modernization after these great changes had been effected. The first step was taken in the year 1912. The city built a road.

It is noteworthy that in carrying out this initial enterprise a mark of the ancient past was obliterated, for the new thoroughfare belting the city was constructed upon the ruins of the ancient city wall that was built in the Chow dynasty, 500 B.C. This was the beginning. Canton to-day has something more than fifty-six miles of roads. More than ten miles of the roads are asphalted; about fifteen are cement roads and about ten miles of new roadways are in course of construction. Future plans of the Public Works Department, according to Commissioner T. K. Ching, contemplate a network of something like 190 miles of modern roadways for the city in addition to a system of motor roads linking the suburbs and numerous outlying villages. After building the roadway that replaced the ancient city wall it has been only within the past decade that the spurt in road construction has been taken, for the greater portion of the existing system of 56 miles of thoroughfares was built between the years of 1924 and 1929. Looking into the future those promoting the development of Canton foresee an expansion of the city's area from the present eight square miles to an ultimate area of more than sixty square miles.



Mr. T. K. Ching, Commissioner of Public Works Department of the Canton Municipal Government

Reclamation Work on Bund

The whole project of road construction in Canton is, after all, but a detail of the vast scheme of reconstruction and development involving numerous related municipal enterprises. To enlarge Canton's main thoroughfare, the Bund, bordering Pearl River, which is now inadequade for traffic requirements the Public Works Department is filling the channel of the river on the Canton side of Hai-chi Island. This will reclaim a long strip of land and will make the Bund the widest street in the city, capable of meeting the city's swiftly expanding traffic requirements. This work calls for an outlay of $643,500 and will involve also the building of a network of roads to link up the new Bund with city.

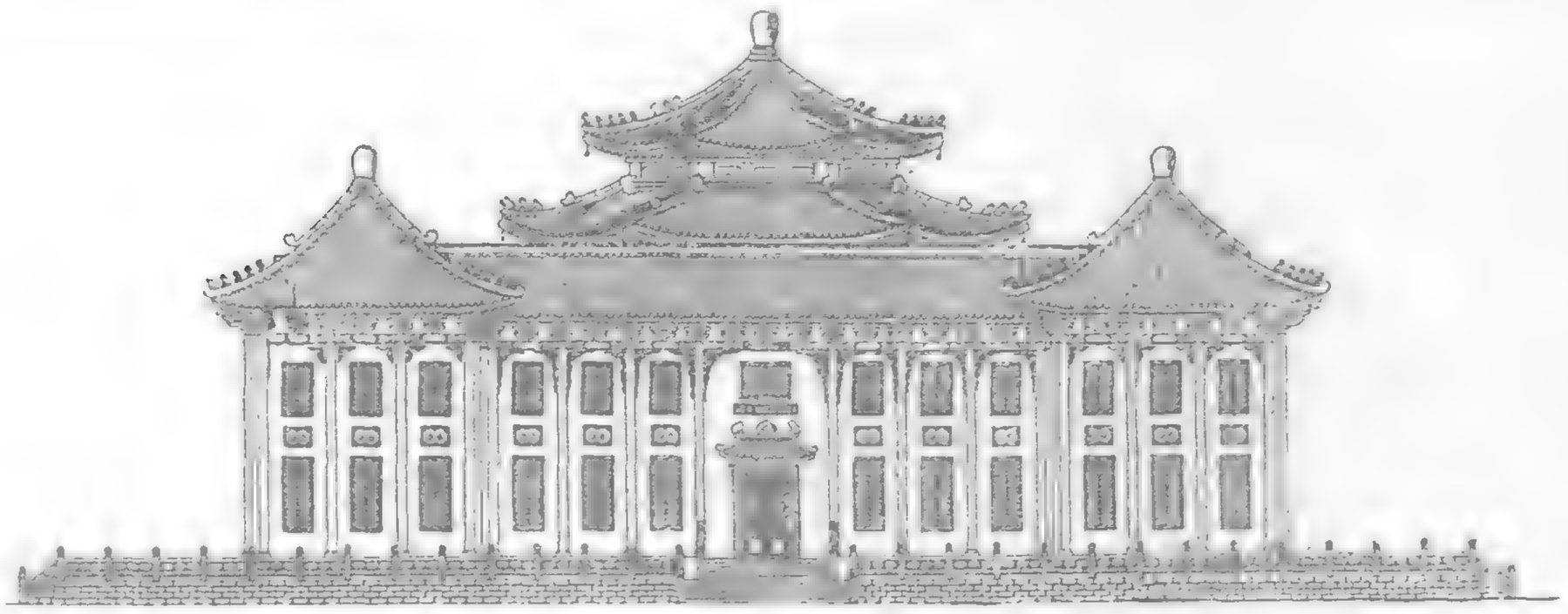
The Chu-kiang Bridge

Canton roughly may be divided into two sections, namely, Canton proper, and Honam, opposite on the southern bank of the upper reaches of the Pearl River. Rapid progress has been recorded in Honam and it is the intention of the Provincial Government to erect the Provincial Government offices there. In connection with this plan it is foreseen that existing transport facilities between Canton and Honam consisting of motor and sampan ferries will be inadequate

and to meet this situation the Public Works Department signed contracts with Messrs. Andersen, Meyer & Company and McDonnell & Gorman Company for the erection of a Scherzer rolling bridge at a cost of Shanghai Taels 1,035,000.

Work on the structure began in November, 1929.

Some detailed description of this, to be known as the Chu-kiang bridge, may be warranted, as it is but one of three bridges planned between Canton proper and Honam. The Chu-kiang bridge is to be 600 feet in length, 60 feet wide and 26 feet above the water level of the river. It will consist of two approach spans, each 220 feet long with a middle movable span consisting of two leaves. The roadway of the structure is to be forty feet in width with footpaths on either side ten feet in width. Opened, the leaves of the bridge have a clearance of 115 feet with complete opening accomplished by means of motors in approximately sixty seconds. Mechanism also is being provided to open the bridge by hand power. For the construction of piers and abutments, cofferdams will be necessary and it is proposed to sink the piers by the open caisson method. Piers and abutments will be faced with granite from top to low water level.



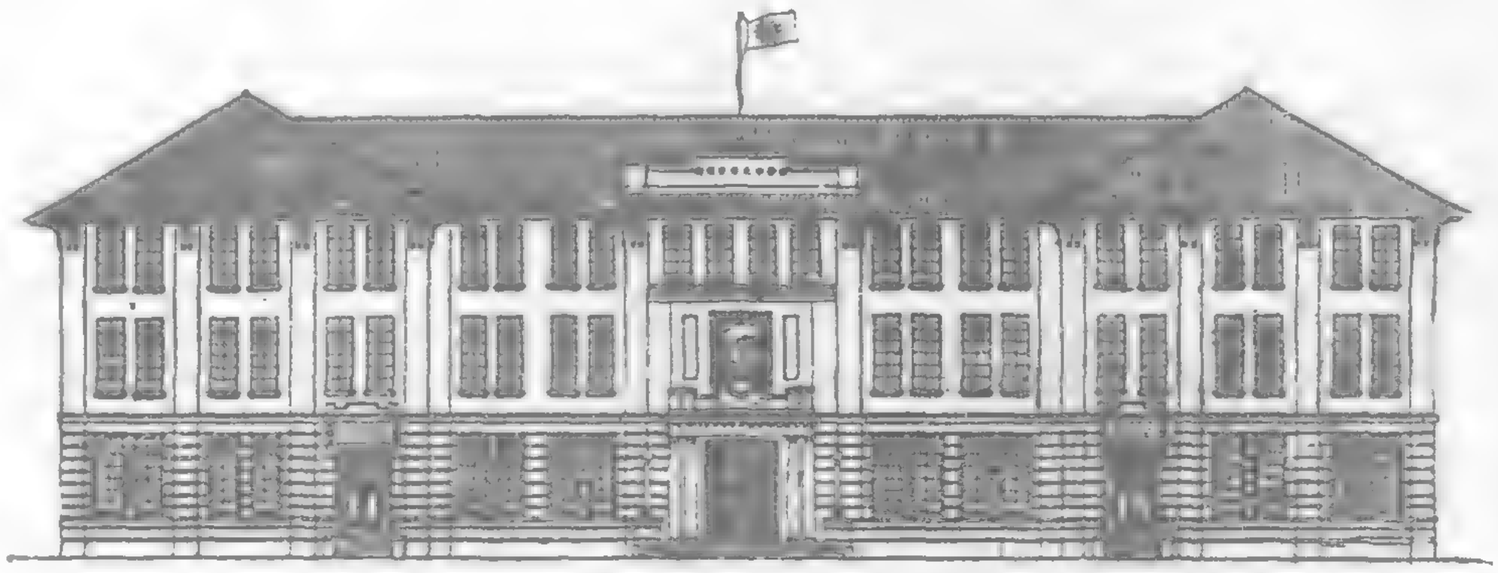
Canton Municipal Library



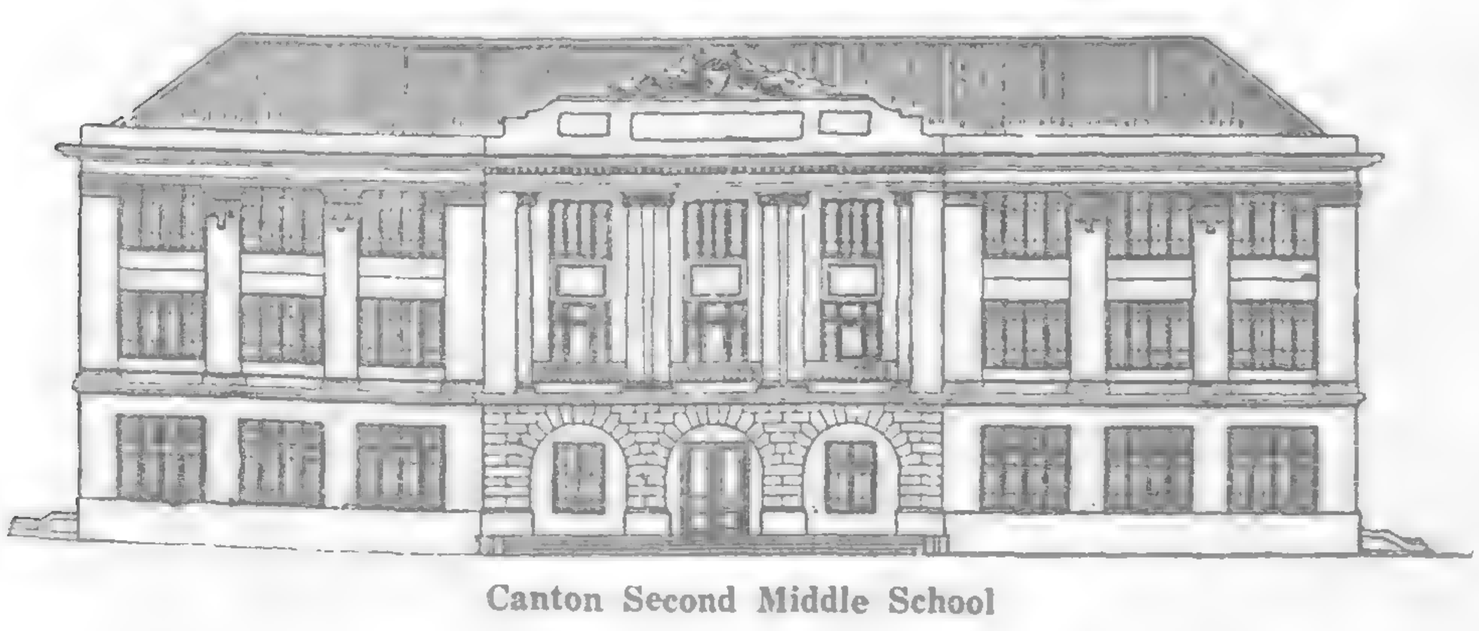
Rear View Municipal Library

A clearance of approximatley 25 feet at average high water level is to be maintained at the bridge center. The Bund level at the bridge approaches is to be raised 25.7-ft. and each half of the bridge to have a grade of 1 to 30, which will give 45.7 at the bridge center. The Public Works Department figures the average water level at about 16 and after checking the Customs' tidal charts for September, 1929—(an average month)—it was found that the average water level will be16.74-ft. Therefore:

Height of abutment 36.7-ft.
10-ft. gained by bridge grade, 45.7 at bridge center
Average high water level 16.74
Clearance at bridge center 28.96



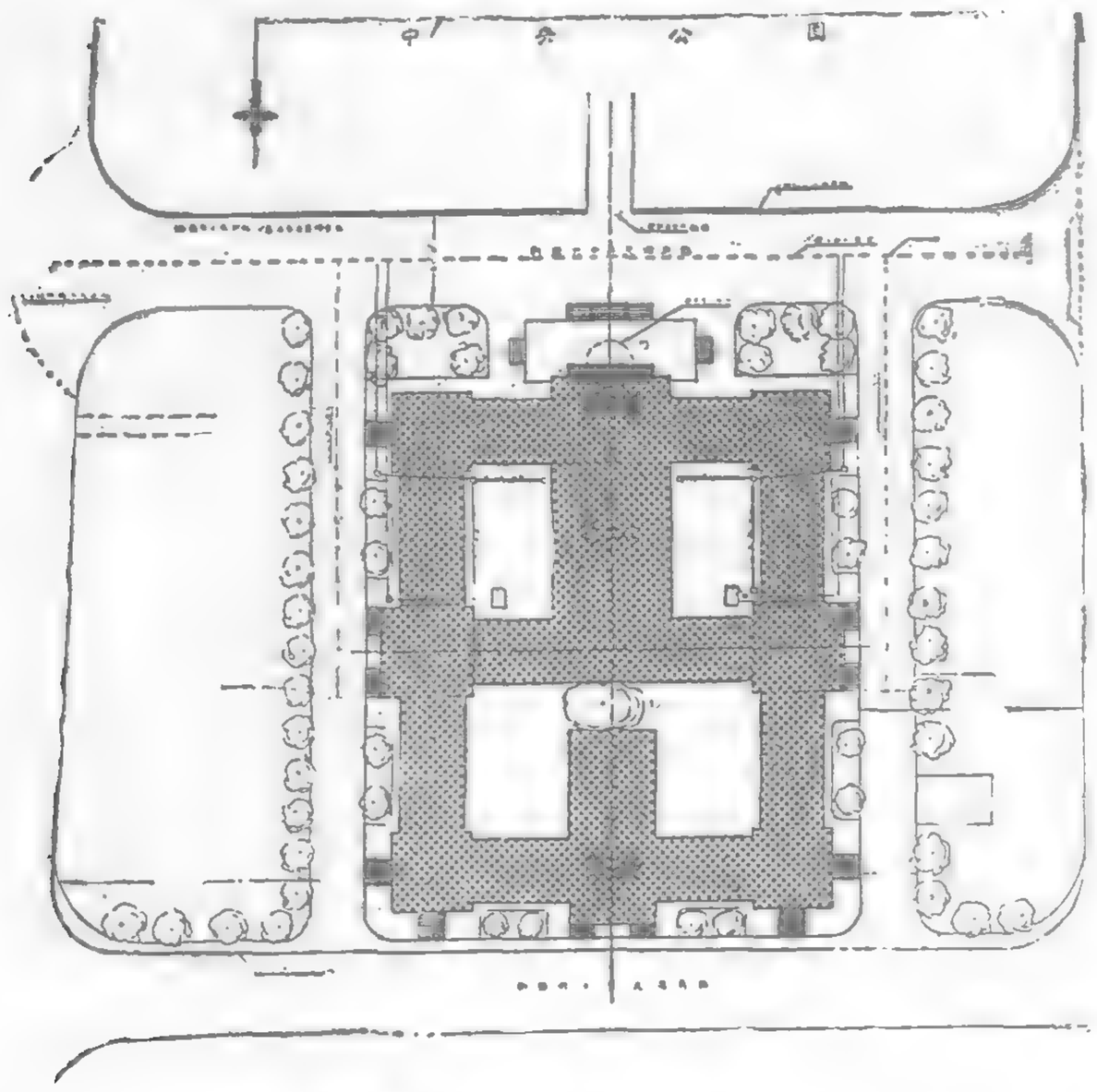
Canton First Middle School



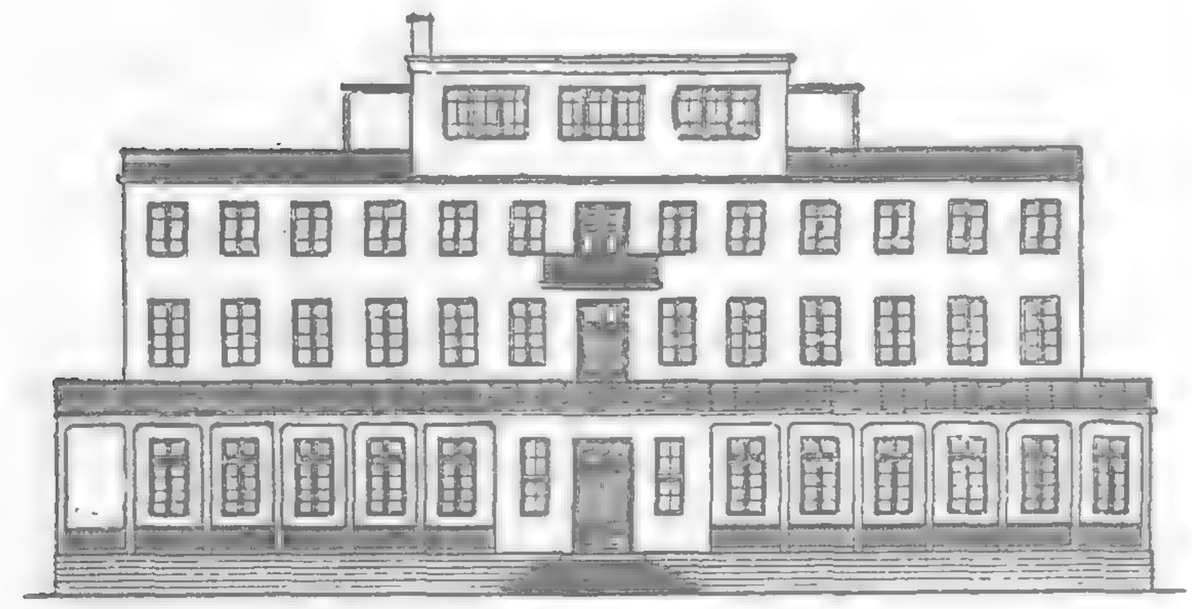
Canton Second Middle School

The weight of structural steel to be used is about 1,700 tons and cast and reinforcing steel, 85 tons. The specifications accord with American standard specifications for city bridges:

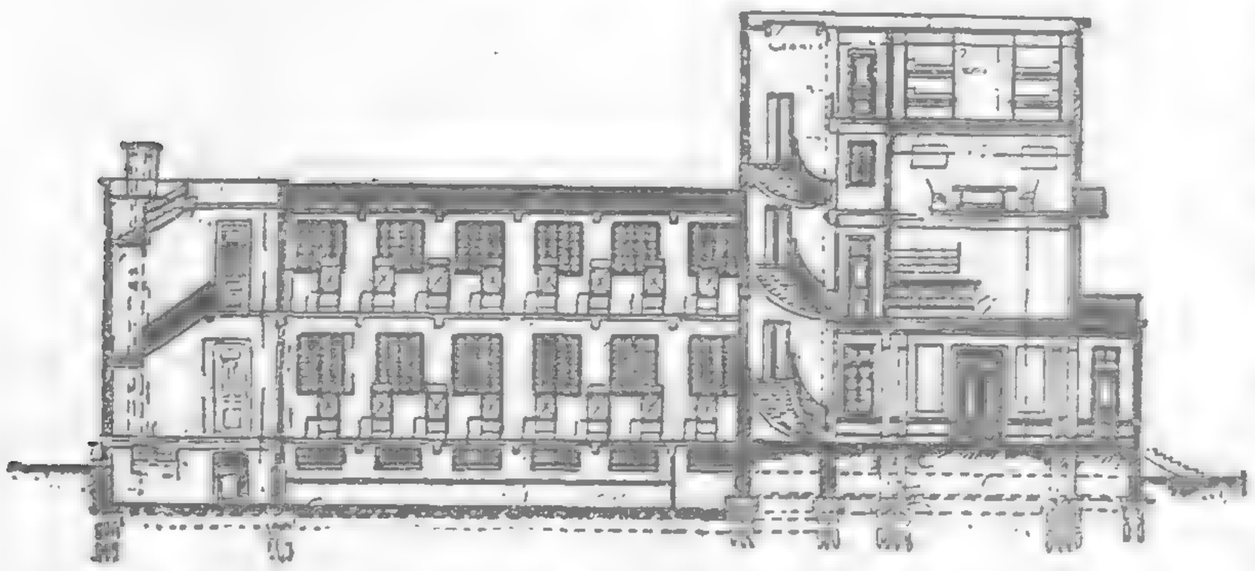
(1) Dead loads to be in accordance with the loads resulting from the design of the bridge.
(2) Live loads—floor system—2 20-ton trucks and 100 lbs per sq. ft.
(3) Trusses—100 lbs. per sq. ft. of roadway and 80 lbs. per sq. ft. on each side walk.
(4) Impact—floor system 25 per cent.
(5) Trusses 100/L 300



Plan of Canton Civic Center



Home for the poor



Front Elevation and Interior of Canton Municipal Poor People's Home

Building Operations

General extensive building operations that are planned radiate from a Civic Center as a focal point to be established on the location of the present Central Park, near the Sun Yat-sen Memorial Hall. Here will be located all the City government offices according to a plan drawn by Mr. Lam Ka-min carrying an estimated outlay of $1,120,000. A contract for building of the Civic Center has been signed with the Wen Hua Company and actual work, it is expected, will be begun soon.

According to the project of the City Planning Commission the future greater Canton is to be built in three zones—industrial, residential and commercial. Tung Shan, the district east of Canton, is to be developed into a residential section and in this area already a number of attractive residential and other structures have been built by the Public Works Department as models. With the co-operation of the Canton Bureau of Social Affairs five "Poor People's Cottages" have been erected at a cost of $76,580 each. Dwellings in these are let at a rental of 80 cents a month and at present dwellings to accommodate 2,000 persons are in readiness.

Public Utilities

In the field of public utilities it may be recorded briefly that Canton recently took over control and management of the Power Company of Canton and a committee of reorganization of the Kwangtung Power Company was organized and is engaged in developing and extending the use of electric power. General Teng Yen-hua, Director of the Kwangtung Construction Commission, is chairman of the committee which has in mind a major enterprise to employ water power to supply current for lighting, heating and power in southern China, as described in the May issue of *The Far Eastern Review*.

The municipal authorities also recently brought into use a modern automatic telephone system under a contract signed by the municipal government with the China Electric Company, an associate of the International Telegraph & Telephone Corporation. This has meant the installation of an initial equipment of 4,000 automatic telephone lines of the Standard Electric rotary machine switching type with an ultimate capacity of 10,000 lines in the City of Canton, and an initial equipment of 300 lines with an ultimate capacity of 800 lines on the Island of Honam, the two systems being connected by means of a 50-pair armored submarine trunk cable laid across Pearl River. This work was completed last year at an outlay of Gold $690,000. An additional sum of about a million dollars is being expended for a long-distance toll-telephone cable that will link Canton and Hongkong and now is near completion.

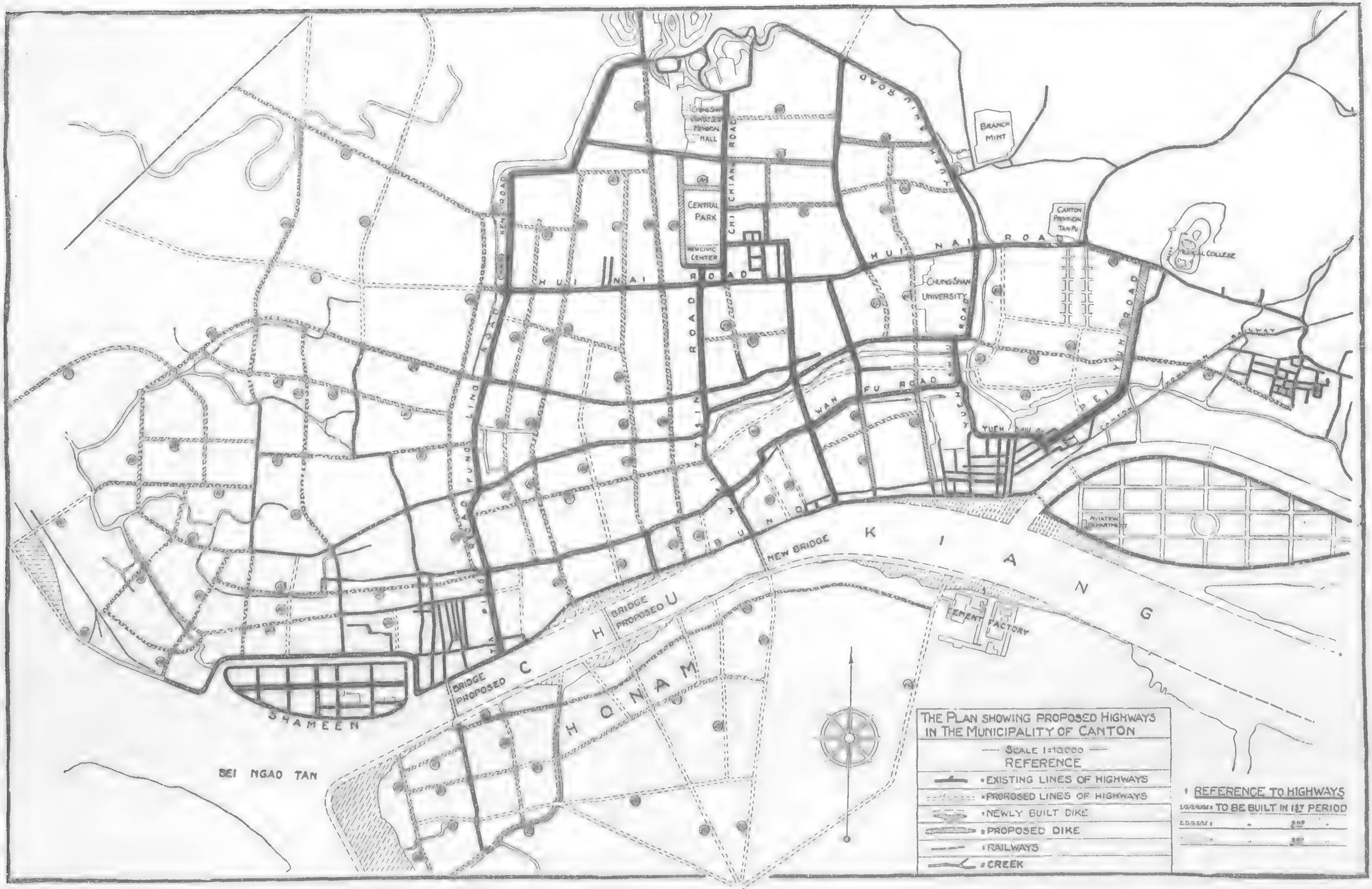
The Water Supply

As a detail of its growth and expansion Canton's authorities are giving close attention to the question of water supply. Canton has two systems, one at Tung Shan, the newly developed residential district and a plant the city government built two years ago. Dr. Wu Pek-liang, former Commissioner of the Canton Waterworks early in 1929 signed a contract with a leading British company for erection of a new plant to supplement the old waterworks of Canton. When this new plant is completed a supply of ten million gallons of pure water an hour will be provided. The water is supplied from Pearl River six miles from the city and is pumped to filters by means of three electrically driven low-lift pumps, each capable of handling 5,000,000 gallons per hour. The new waterworks additions, now nearing completion run in cost to $2,000,000.

Along the line of cultural improvements two schools, the First and Second Canton Middle Schools, are being built at a cost of about $200,000 and a Chung Shan Library, to cost $168,000 also is in course of construction. Extensive improvements are to be made to the five public parks of the city and four additional parks are to be established in the future.

It is estimated that the grand total cost of all the various works of improvement and development in Canton runs to about $25,655,000, and it follows logically enough that by reason of work accomplished and projects in prospect for the future values in general, and particularly realty values, have gone skyward. According to published reports early in April this year Canton despite political upheaval and unrest was in the midst of a typical American land boom marked by a great tide of both real buying and speculative operations resulting in price advances of as much as eighty per cent.

Two major favorable causes for the realty situation are to be traced in addition to the improvements going forward within the city. These are the current low price of silver and the fact that the flood of money that pours into Canton from Chinese overseas largely is being diverted just now into the purchase of land


BRANCH MINT
CANTON PROVISIONAL TAN PU
CENTRAL PARK
NEW CIVIC CENTER
CHUNG SHAN UNIVERSITY
HUI NAI ROAD
CHI CHIANG ROAD
FUNG LING KEN ROAD
SIN TSUN ROAD
WAN FU ROAD
YUEH HSIU ROAD
PEI YUEH HSIU ROAD
NEW BRIDGE
BRIDGE PROPOSED
SHAMEEN
BEI NGAO TAN
CEMENT FACTORY
AVIATION
KIANG
HONAM
THE PLAN SHOWING PROPOSED HIGHWAYS IN THE MUNICIPALITY OF CANTON
SCALE 1:10000
REFERENCE
EXISTING LINES OF HIGHWAYS
PROPOSED LINES OF HIGHWAYS
NEWLY BUILT DIKE
PROPOSED DIKE
RAILWAYS
CREEK
REFERENCE TO HIGHWAYS
TO BE BUILT IN 1ST PERIOD
" " 2ND "
" " 3RD "





Sinking the Caissons in the Pearl River for the Scherzer Rolling Lift Bridge

Plans for Deep Water Harbor

Perhaps the most ambitious of all the great projects at Canton is the direct linking of the city with the outside world, giving Canton place as a great world port by the construction of a deep water harbor.

At an estimated cost of $41,720,000 it is planned within 10 years to establish a harbor 35 feet deep wherein the largest ocean steamers will have ample mooring facilities at wharves provided with all modern facilities. The necessity for a deep water harbor has become more and more apparent with the swift expansion of Canton's foreign trade through recent years. In 1929 imports of the city went to a total of Haikwan Taels 42,862,944 and exports to Haikwan Taels 85,607,839.

As a detail of his scheme of national reconstruction Dr. Sun Yat-sen first suggested the building of a harbor in 1924 at the mouth of the Pearl River at Whampoa where surveys revealed the greatest natural depth of the stream. Little was accomplished until after the Nationalist forces conquered the province of Kwangtung in 1926. Then the Whampoa Harbor Committee was organized with T. V. Soong, Sun Fo, C. C. Wu and Chen Kung-po as members. The most important action taken by the committee at that time was the formation of the Whampoa Harbor Company with a capital of $20,000,000, half of which was to be raised from public subscription and half to be provided by the Canton city government. The intention announced was to make Canton a free port and the task of starting the enterprise was entrusted to Mr. Kou Wei-lian, as chief architect. The Bureau of Finance was asked to appropriate $500,000 to start operations and an additional sum of $6,760,000 was asked for to carry out the first part of the construction work. Teng Tsu-yu became president of the company.

At the time the company was organized in June 1926 Canton was pouring its resources into the Nationalist military expedition that marched on the Yangtze and this caused delays in pushing the harbor work. After the National Government was organized at Nanking active work on the big project was resumed under direction of the River Conservancy Commission of the Province of Kwangtung.

Six separate schemes and designs were examined before the decision was reached to establish the harbor in the district known as Yuechue, opposite the Whampoa Military Academy. This is about thirteen miles east of Canton and twenty miles from the sea. A motor road along the Chung Shan Memorial Road links Yuechue with Canton.

As a part of the building of the port it is planned to construct nine wharves and immediately adjacent to them ten warehouses all served by a branch railway connecting the harbor with the Canton-Kowloon railway. Canton's industrial area is to be developed in the district along the river opposite Yuechue where a new power house is to be established to supply electricity to industrial plants and to light the port and a part of the harbor project is the erection of a steel bridge connecting the harbor and the industrial district.



Model of Scherzer Rolling Lift Bridge at Canton

Each of the nine wharves to be built are to be 700 feet long and 150 feet wide fully equipped for the transfer of cargo between ships and warehouses. The distance between the wharves will be 400 feet affording ample space for all ordinary movement of shipping. The ten warehouses are to be located 25 feet distant from the wharves and each will be 540 feet long and 90 feet wide. The warehouses will occupy an area of 48,600 square feet.

The construction of the port has been divided into four periods and the work and outlay for each period have been planned in detail by the Committee as follows:

(1) The First Period—

(*a*) Dredging of 2,609,068 *ching* of the river bed to a depth of 35 feet at the mouth of the river a at cost of $5,218,136.

(*b*) Dredging of 1,109,041 *ching* of the river bed to a depth of 35 feet at a cost of $2,218,082.

(*c*) Construction of the first part of the wharf frontage of 2,375 feet at a cost of $356,250.

廣州黃埔外港計劃

PROJECT FOR CANTON OUTER HARBOUR AT WHAMPOA

SECTION A-A

SECTION B-B

SECTION C-C

SCALES 1:750

SCALES 1:5000

TUNGPO MARKET

INDUSTRIAL SECTION

SHAMEEN

PASSENGER STATION

NO 3

NO 2

NO 1

WATSON ISLAND

HOSPITAL SECTION

MUSEUM MARKET

ELECTRIC POWER STATION

PEBBLE ISLAND

WHAMPOA ISLAND

SUNCHOW

WHAMPOA

MILITARY SCHOOL

DANES ISLAND

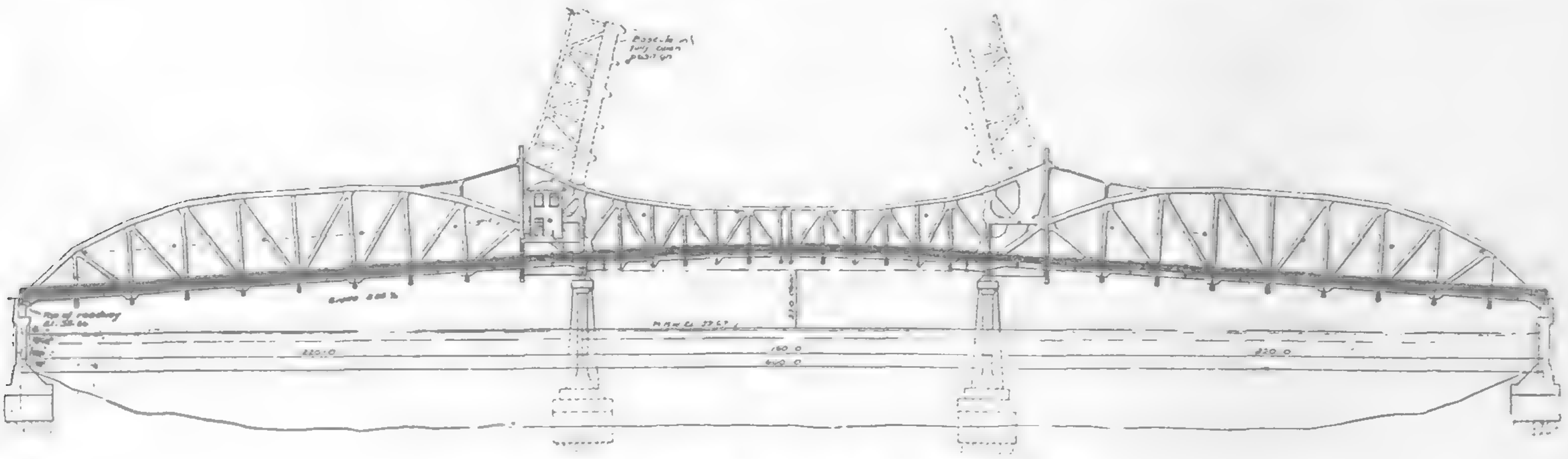
THE FLAT ISLANDS

FUTURE HARBOUR EXTENSION

PROJECTED BY

DRAWN BY

CANTON JUNE 1930



Elevation of Scherzer Rolling Lift Bridge over Chukiang

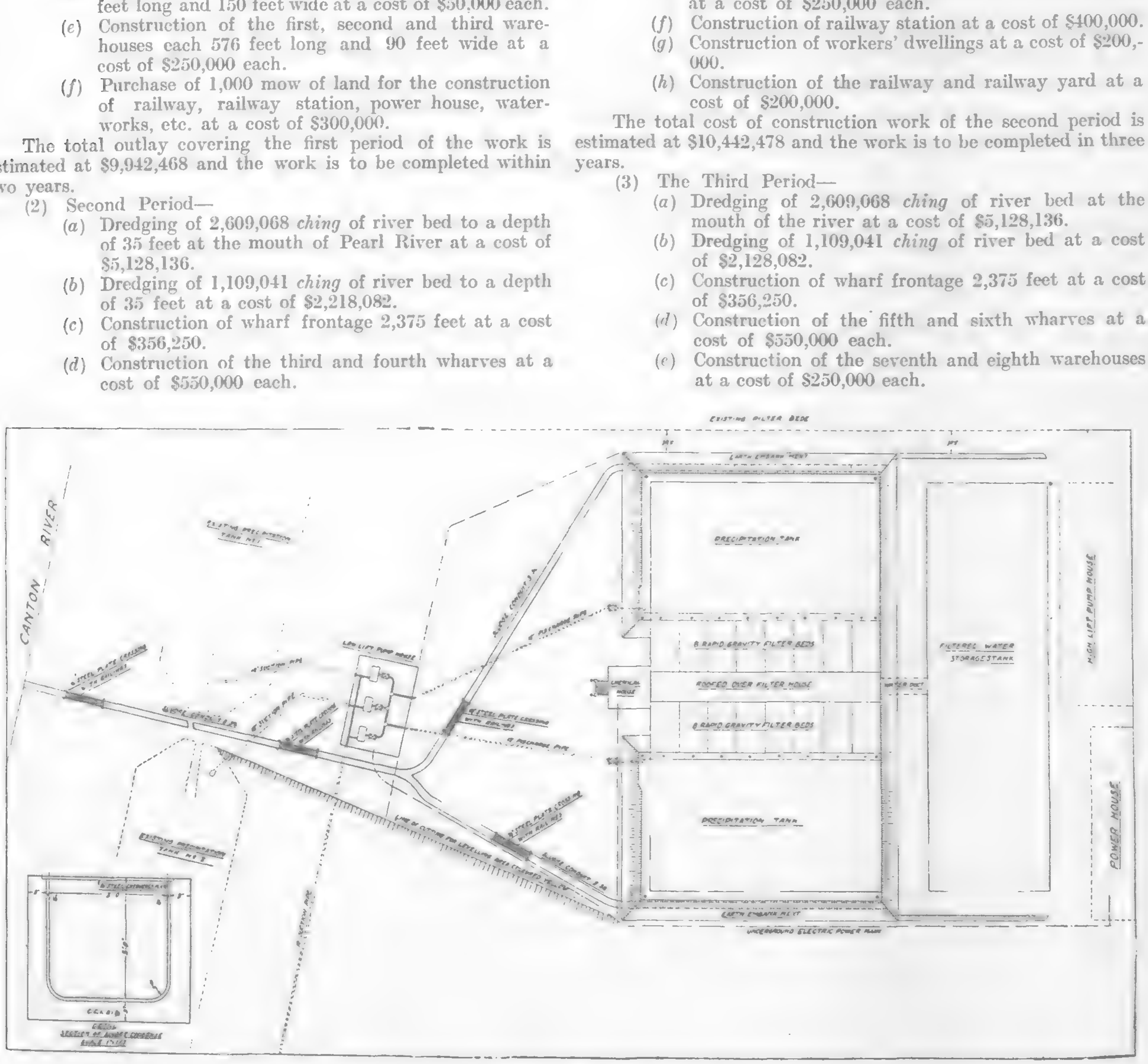
(*d*) Construction of the first and second wharves 700 feet long and 150 feet wide at a cost of $50,000 each.
(*e*) Construction of the first, second and third warehouses each 576 feet long and 90 feet wide at a cost of $250,000 each.
(*f*) Purchase of 1,000 mow of land for the construction of railway, railway station, power house, waterworks, etc. at a cost of $300,000.

The total outlay covering the first period of the work is estimated at $9,942,468 and the work is to be completed within two years.

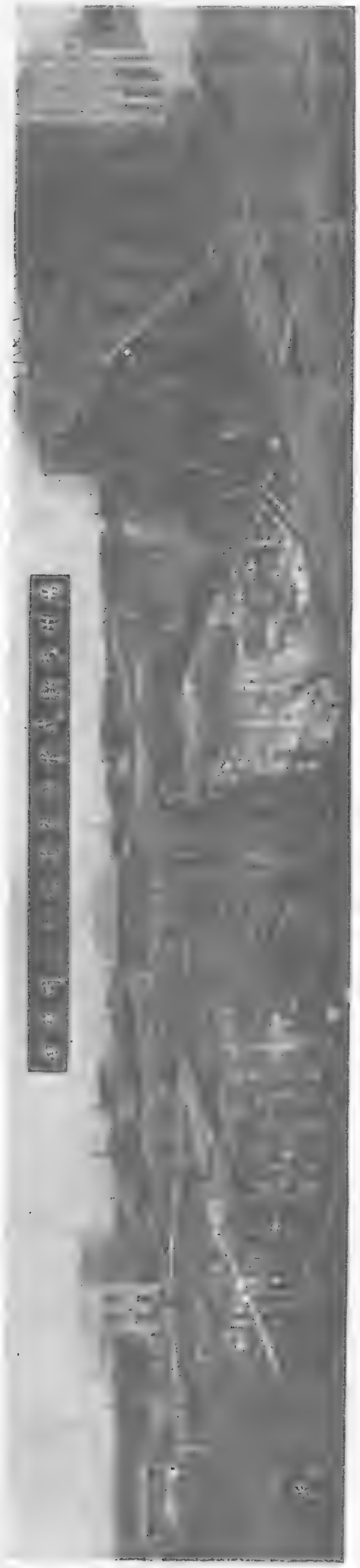
(2) Second Period—
(*a*) Dredging of 2,609,068 *ching* of river bed to a depth of 35 feet at the mouth of Pearl River at a cost of $5,128,136.
(*b*) Dredging of 1,109,041 *ching* of river bed to a depth of 35 feet at a cost of $2,218,082.
(*c*) Construction of wharf frontage 2,375 feet at a cost of $356,250.
(*d*) Construction of the third and fourth wharves at a cost of $550,000 each.
(*e*) Construction of the fourth, fifth and sixth warehouses at a cost of $250,000 each.
(*f*) Construction of railway station at a cost of $400,000.
(*g*) Construction of workers' dwellings at a cost of $200,000.
(*h*) Construction of the railway and railway yard at a cost of $200,000.

The total cost of construction work of the second period is estimated at $10,442,478 and the work is to be completed in three years.

(3) The Third Period—
(*a*) Dredging of 2,609,068 *ching* of river bed at the mouth of the river at a cost of $5,128,136.
(*b*) Dredging of 1,109,041 *ching* of river bed at a cost of $2,128,082.
(*c*) Construction of wharf frontage 2,375 feet at a cost of $356,250.
(*d*) Construction of the fifth and sixth wharves at a cost of $550,000 each.
(*e*) Construction of the seventh and eighth warehouses at a cost of $250,000 each.



Layout of Tsang Pon Waterworks



General View of Canton Municipal Waterworks at Tsang Pon, under Construction

(*f*) Construction of the ninth and tenth warehouses at a cost of $150,000 each.

(*g*) Construction of waterworks at a cost of $400,000.

The total cost for consttruction work of the Third Period is estimated at $10,092,568 and the work is to be completed within two years.

(4) The Fourth Period—

(*a*) Dredging of 2,218,082 *ching* of river bed at the mouth of the river at a cost of $5,128,136.

(*b*) Dredging of 1,109,041 *ching* of river bed at a cost of $2,218,082.

(*c*) Construction of wharf frontage 2,375 feet at a cost of $356,250.

(*d*) Construction of the seventh, eighth and ninth wharves at a cost of $550,000 each.

(*e*) Construction of the eleventh and twelfth warehouses at a cost of $150,000 each.

(*f*) Construction of power house at a cost of $500,000.

(*g*) Construction of railway work shops at a cost $500,000.

(*h*) Miscellaneous costs $500,000.

The total cost for construction work of the Fourth Period is estimated at $11,242,468 and the work is to be finished in three years.

Nanking Throws a Boomerang

(Continued from page 338).

enormous, but all foreign creditors and bondholders have reposed the fullest confidence in the good faith of the present government and especially in its Minister of Railways and its Minister of Finance. The character of these two American-educated officials have done more to strengthen the Nanking regimé abroad than the achievements of its more spectacular military leaders.

To be officially informed at this late date that millions of dollars that might have been employed in liquidating outstanding debts or for purchasing new railway materials have been diverted into the pocket of Mr. Sun Fo, is an admission that will lose the National Government its one great credit asset ; foreign confidence in the integrity of its officials. For, if these charges against Sun Fo are permitted to stand in the record, they will constitute a bar to any further credit arrangement to Nanking until the machinery is created to supervise properly all revenues collected and disbursed.

—G. B. R.

Japan's Electric Light and Power Enterprises

(Continued from page 345).

franchises have been negatived, as a practical matter, by agreement between the companies concerned.

Economic depression, which has visited Japan as well as the rest of the world, has undoubtedly accentuated an opinion held by some that there is electrical equipment installed in excess of present day needs. But in general the operators in the industry have the situation well in hand. Earnings have stood up remarkably well, general business depression notwithstanding. Bond interest is being earned with ample margins. If the companies have overbuilt in recent years there should be less need in the immediate future for additional finance. There are clear evidences that construction programs are being modified to meet existing conditions, rather than conditions as existed a few years ago when Japan was requiring say 10 per cent more electricity each year. Dividend rates are being reduced, and further cuts in dividend rates are possible this year. However, these reduced dividends reflect not only some decrease in earnings, but also more conservative accounting practices and more conservative views as to conditions in the future than ruled in recent years when the utilities were passing through an era of great expansion.

Rates for supplying electric light and power in Japan are moderate, and compare favorably with those in other highly electrified countries. According to statistics published by the Department of Communications, rates for electricity in Japan have shown a downward tendency since 1921. This has been due to generally lower prices, increased generating efficiency, and larger volume of output. Rates are subject to general supervision by the Government. Successive decreases in rates appear to have been prompted largely by actual or potential agitation on the part of consumers for reductions, as well as by actual or potential competitive activities of other utility operators.

The Future

There are excellent reasons for looking forward with confidence to the future of electricity in Japan. *Per capita* consumption of electricity is still low, and has been estimated at considerably less than 200 k.w.h. annually as compared, for instance, to more than 600 k.w.h. annually in the United States or more than 1,500 k.w.h. in Norway. There is every reason to expect increasing consumption of electricity on the part of Japanese. Sales programs to place electric refrigerators, electric irons, vacuum cleaners, water heaters, etc., have been aggressively adopted, and there are indications that such sales campaigns are meeting and will continue to meet with considerable success. But quite aside from increased consumption of electricity in the household, the important increases in total demand will be for industrial and commercial purposes. Japan's future lies as a trading and industrial nation in order that adequate employment may be given to her teeming population. Available coal resources are comparatively meagre, and although potential " white coal " is abundant, Japan in the years to come may be expected to need such electric resources as nature has endowed her with, in order to fulfill her rôle of " industrial nation of the East."



Surface Installations of the Kaiping Mines at Tongshan

The Kailan Mining Administration and Its Employees

It is constantly being said that in these days of intense competition only the most efficient industrial enterprise can survive, and the word "Rationalization" is in all men's mouths as the new specific for ensuring efficiency.

By rationalization is meant the co-ordination on a large scale of the production, transport, distribution and sale of any commodity, so that duplication of effort may be avoided, waste be eliminated and the cost to the consumer be reduced to a minimum. The rationalization of the coalfields of Great Britain is prescribed as the only remedy which can restore prosperity to a great national industry. Private effort and special legislation are being directed towards achieving it. What has recently been accomplished in Germany is being held up as an example. It does not appear, however, to be generally known that in China eighteen years ago the operation of one of the largest coalfields in the country—if not the largest—and the distribution and sale of the whole output was rationalized with a thoroughness and comprehensiveness which has so far proved unattainable in countries generally considered to be more progressive.

The properties affected were owned by two competing companies; a Chinese company known as the Lanchow Mining Company, and a British company registered in London as the Chinese Engineering & Mining Company, Ltd. No amalgamation or transfer of shares took place; each company retained possession of its separate assets, but each agreed to entrust the management of its entire business to a single administration to be called the Kailan Mining Administration.

The field whose operation was thus co-ordinated is known as the Kaiping coalfield. It is situated in the Province of Hopei, till lately "Chihli," midway between the port of Tientsin and the Port of Chinwangtao. The latter port was opened with the specific purpose of developing an overseas business in Kaiping coal. It has now a harbor with berths for seven ocean-going vessels, open at all times of the year and at all states of the tide. The harbor with the connecting railway, storage yards, godowns, power plant, workshops and all the usual public utilities of a flourishing township is under the control of the Administration.

The Kaiping field, it is estimated, contains over three thousand million tons of workable coal. Five mines are in operation. The daily output has already reached 18,000 tons and the mines are equipped to produce a substantially greater quantity if and when circumstances permit.

As the coal produced is bituminous it is in demand for steam-raising and other industrial purposes in all the ports of China and along the navigable waterways. It is also extensively used for bunkering steamers, while its coking properties give it a special value as coke-making coal. To facilitate distribution the Administration maintains a fleet of colliers and suitable sales yards, selling agencies and handling facilities at the principal distributing points. These last include a mechanical handling plant at Shanghai, which is believed to be the most complete installation that exists anywhere for the unloading, heaping, reclaiming, and reloading of coal.

It is difficult for those whose experience is confined to more highly industrialized countries to appreciate the multifarious extent of the subsidiary activities in which the Administration has found it necessary to engage in order to build up an industrial enterprise on this scale in China. On the purely technical side, for example, it has proved necessary to equip workshops capable of repairing anything from stop-watches to locomotive engines, from magnetos to steamships, and of making anything from a split pin to a pithead gear; the independent manufacture of such widely different commodities as leather and ice has had to be provided for.

That the Administration should find employment for over 40,000 men is not in such circumstances surprising. That the care of so many workers in a country which, as has been truly said, is in a stage of rapid transition presents a problem of considerable magnitude will be readily appreciated. It is the purpose of this article to explain along what lines the Administration is endeavoring to find a solution.

Conditions of Working

The Kaiping coalfield has been worked for several hundred years. Over fifty years ago mining by modern methods was begun. In those days the conscience of the world had not been awakened to the duty which the employer owes to the employee. In China at any rate there was no interference with the operation of the law of supply and demand in the labor market, and employers considered that they had done all that was required of them if they offered a wage for which men were willing to work.

Up to the end of the last century the conditions underground in a mine such as Tongshan where large quantities of water have to be dealt with, though no worse than elsewhere in the world, were such as some might describe as trying, others as horrible. The air underground was rendered hot and humid by a net-work of steam pipes and the discharge of steam from pumps. It was fouled by the burning of oil lamps, and the best that could be done with the means of ventilation available was to produce a sluggish current of air. It is no wonder that the workers, stripped to the skin, found that conditions were barely supportable.

The companies, whose business the Administration took over, had already produced an enormous improvement in these conditions. The substitution of electricity for steam in itself worked a

THE KAILAN MINING ADMINISTRATION, NORTH CHINA



The Kailan Head Office at Tientsin



Change of Shift at Tongshan



Electric Safety Lamps



The Central Power Station at Tongshan

transformation. Improved methods of ventilation and more suitable lamps effected further betterment. The Administration has considered it the first of its duties to the workers underground, whose number is over 30,000, to render conditions as safe and as healthy as modern scientific methods make possible. To this end electricity has been entirely substituted for steam underground; electric haulage is being substituted for mule haulage; the latest type of electric lamp for miners has been adopted. A complete system of main and subsidiary ventilation renders the air underground fresher and more equable in temperature than in any factory. A wholesale substitution of electric for steam winding engines has taken place. The electrification of the mines has, indeed, gone so far that at the newest mine, Tangchiachwang, there is no single steam engine installed. All the power required is transmitted from the central power station at Linsi mine, whence current is transmitted over a 50-mile circuit at 30,000 volts.

In all matters of technical equipment the Administration has taken as its standard the best that the world can produce. It is its boast that it need not now fear comparison in this respect with any mine in any country. It is its ambition to leave nothing undone which science can suggest for the safer, the more efficient and the more economic operation of the property. This does not, however, imply that every labor-saving device has been or should be adopted. For reasons explained in the last section of this article neither efficiency nor economy will necessarily be promoted in China by installing any particular labor-saving machine, even though its use may have proved profitable elsewhere.

Policy in Dealing with Labor Force

Mining in China, as in many other parts of the world, is to a very large extent an hereditary calling. Only when in desperate straits does the agricultural worker take to working underground.

The home of the best miners in China is in the Province of Shantung and the southern part of Hopei Province, and it is from these regions, several hundred miles distant from the Kaiping coalfields, that the greater number of the miners have always come to seek work underground. They came in not as immigrants with their families but as lone men seeking temporary occupation. Obviously from the social as well as from the economic point of view, there are grave objections to a migratory labor force of this character. Consequently, when the Administration had solved the problem of creating satisfactory working conditions it set itself the task of endeavoring to create an indigenous mining population. In order to accomplish this much more has necessarily to be done than merely to offer an adequate wage. If miners are to be induced to bring their families to settle in what is to them a strange country far from the graves of their ancestors, they must inevitably be offered much more in the way of the amenities of life than they have been accustomed to in the villages where they were born. They must be offered, for example, good houses, good water, care of the sick, education for their children and an assurance that if they should die prematurely among strangers their wives and families will not be left destitute.

As coal is raw material for most manufactures, the opening of the Kaiping coalfield has naturally led to the starting of other new industrial enterprises in the coalfield. One of the Chinese Government Railways, now known as the Peiping-Liaoning Railway, has at Tongshan its principal workshops. A large Chinese company, known as the Chee Hsin Cement Company, has erected at the same place a large and up-to-date cement plant. Another Chinese company, the Hua Hsin Cotton Spinning & Weaving Company, has opened a flourishing and prosperous cotton mill. The enlightened and progressive directors of these Chinese enterprises share the Administration's views in regard to the need for improving the laborers' conditions and it has consequently been found of advantage that the Administration should co-operate with them in certain branches of welfare work. In the care of the destitute it has also been possible to enlist the voluntary aid of missionaries, both foreign and Chinese, who have devoted their lives to philanthropic work in China, more particularly, the Roman Catholic missionaries at Tongshan. The principal problem of effecting the gradual substitution of a resident mining population for a casual labor force, is, however, peculiar to the Administration and it has consequently found it necessary to make its own independent plans for dealing with it.

Housing

For administrative purposes the staff is subdivided into four main classes:—

(1) Senior staff, comprising the management, the engineers, the principal officials in charge of different branches of the Administration's activities at headquarters, at the mines and elsewhere.
(2) Clerical staff, comprising clerks and other office workers, as well as those doing work of a clerical nature outside.
(3) Technical staff, comprising the principal subordinates of the engineers.
(4) Laborers, comprising artisans, miners, common laborers, and all other manual workers.

The aggregate number of senior staff employees is just over two hundred of whom half are foreigners. The whole of the rest of the staff are Chinese. The clerical and technical grades include altogether, approximately, 2,500 men, while the laborer grade includes nearly 50,000 men on day wages or piece work, paid directly or through contractors or overmen.

Up to ten years ago very little had been done to provide housing accommodation, except for the senior staff at the mines and at Chinwangtao. Clerks and technical staff were left to do the best they could to find accommodation in the towns which rapidly grew up at Tongshan, the headquarters of the mines, and at the port of Chinwangtao, or in villages near their work. Barracks were provided for the accommodation of the laborers where large numbers of single men lived together in messes. Nothing whatever had, however, been done to encourage any other mode of life. About that time the Administration set itself the task of building houses in which employees of all grades could live with their families. Up to date nine hundred separate houses have been built for the accommodation of technical and clerical staff and some two thousand seven hundred houses for the accommodation of laborers. This means that, apart from the members of the senior staff and their families, some twenty thousand persons are now living in the Administration's family quarters. As in many cases the father of the family and several sons of working age live under the same roof, fully six thousand of these persons are employees.

In designing these houses no attempt has been made to adopt western ideas in regard to domestic architecture. Economy in the cost of building and in the use of land could have been effected by construction on the tenement plan. Though Chinese workmen will reconcile themselves to residence in houses of this type, as may be seen in Shanghai, they are foreign to Chinese ideas of what a home should be. The Administration has preferred to take as their model, so far as the general arrangement of the dwelling goes, the peasant's cottage as built from times immemorial in North China. Each house has, therefore, its own enclosed courtyard from which access is obtained to the dwelling and to the various out-houses. All are single storied, and provided with kangs for sleeping and stoves for cooking, designed to meet a Chinese peasant's ideas of what is comfortable and convenient—ideas, it may be said, derived from age long experience of life in the rigorous climate of the northern plains.

It is only in the matter of the material used that the Administration has broken with tradition. Cement and lime have been substituted for mud, good stone has been substituted for poor brick. The buildings are all substantial, wind and weather proof, constructed with a view to reducing maintenance costs while promoting cleanliness and health.

These houses are arranged in streets in such a way that every house has a southern aspect, a most important consideration under the climatic conditions of North China. Owing to the difficulty in the way of obtaining contiguous areas of land these streets constitute a number of different villages. Each village has its water supply, assuring at all times an ample supply of pure water, and its sanitary service, while every house is provided with electric light. A high standard of maintenance and cleanliness is insisted on, and, in order to attain to this, it has lately been found desirable to appoint for each village a " burgomaster " or head man, generally an old employee of the Administration, who is paid a definite salary and of whom no other work is expected but the supervision of everything affecting the welfare of the village community.

The housing policy was first begun in a tentative way as there was doubt whether the new experiment would prove successful.

It is now definitely established that the provision of suitable housing combined with the general welfare work described later does tempt miners to bring their families and establish new homes in the Kaiping coalfield. The policy is, therefore, being steadily pursued in good times and in bad. The social gain arising from the substitution of the home for the coolie barracks is in itself sufficient to justify the heavy initial outlay. It is anticipated that eventually there will be a further gain from the insurance of an adequate labor force at all times, and that sons following the vocations of their fathers will in time to come provide all the new recruits so rendering further immigration unnecessary.

In the case of the least skilled categories of labor it has, however, so far proved impossible to attract the family-man, and it has been necessary, therefore, to consider what is the best that can be done to ensure for the bachelor coolie the decencies of life and a reasonable modicum of creature comfort. The Administration's latest ideas on this subject are embodied in a type of barracks. It will be seen that the principle of a self-contained



A Mining Village



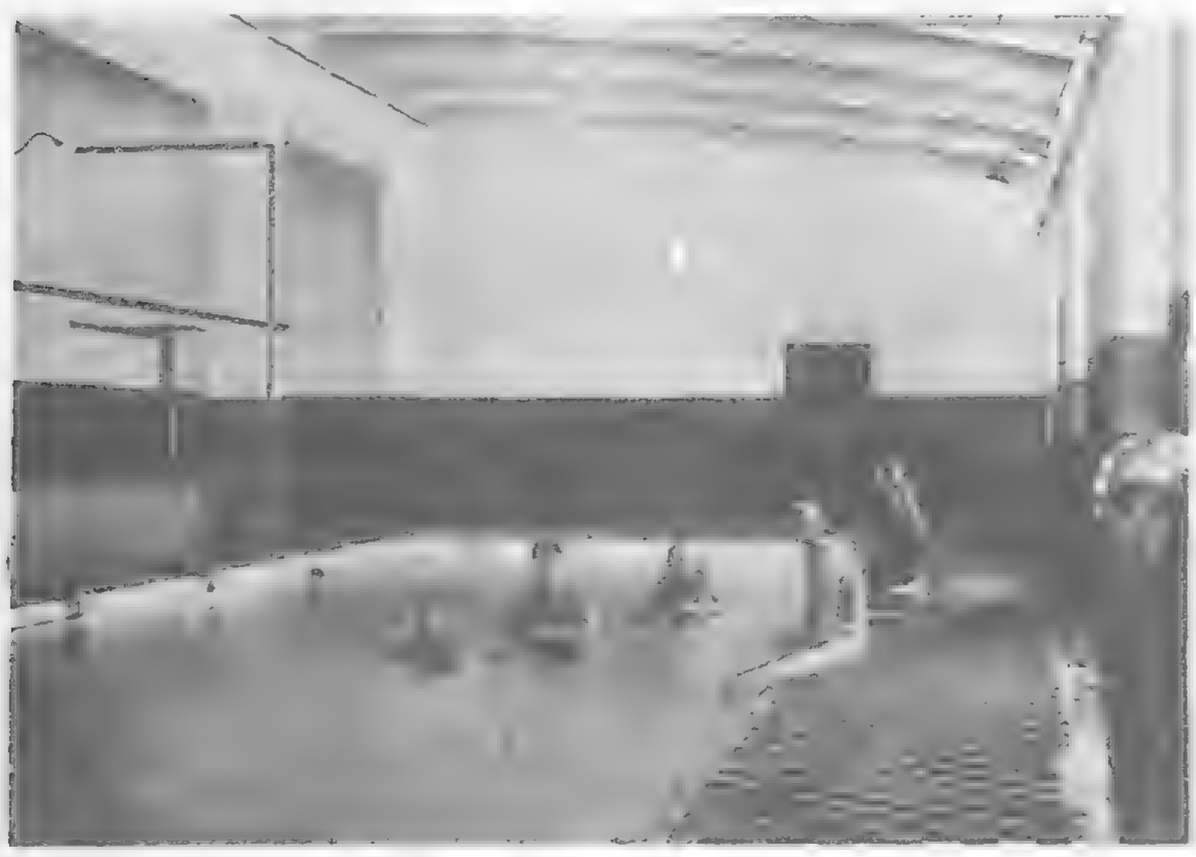
A Laborer's Courtyard



A Mining Village Street



A Quarter For a Labor Gang



Bath for Laborers



General Ward in Hospital

house with an independent courtyard, which the Chinese consider so important in domestic architecture, has been adopted in the case of these communal dwellings. The opportunity which this gives to each gang of organizing, in comparative privacy, its own community life, has been used to foster a spirit of emulation between gangs, which has been instrumental in producing a marked improvement in cleanliness and consequently in health.

Every detail in connection with cooking and washing arrangements, heating, disposal of refuse, sanitation and ventilation has been studied with the object of adapting the facilities offered to the previous habits of the inmates, rather than require the inmates to adapt themselves to unfamiliar ways. The details are in fact so arranged that it is convenient to be clean.

It is, of course, of importance to ensure that the new mining population being created in the mining area is not unfairly exploited. If they are to maintain a reasonable standard of life they must be able to purchase their food and clothing at fair prices. In order to ensure this co-operative stores at each mine offer grain and other food stuffs, cloth, clothing and other personal necessities at a small margin over cost. These stores are managed by a committee representing the staff who use them. The Administration, who provided the requisite accommodation with light and water free of charge, merely retain the right to exercise a general supervision, particularly over the price list which is submitted for examination every month. One man is detailed from each department from time to time to examine the prices and bring to notice any price which appears too high.

Bath Houses

There is a prevalent idea that the lower classes in North China are not much concerned about personal cleanliness. It is no doubt true that many are unable to afford a standard of life in which, under the severe conditions of a North China winter, personal cleanliness is attainable. On the other hand, the experience of the Administration goes to show that this is entirely opposed to their inclination. Bath houses have been provided at all points at which large numbers of laborers are employed. Statistics in regard to the use made of these bath houses go to show that even in winter a laborer visits the bath house at least once a week, and in the summer considerably oftener.

The design of these bath houses takes cognizance of the fact that in China they are required not only for bathing but to fulfill many of the functions of a workmen's club. The accommodation provided consists essentially of a dressing-room where each visitor has a separate pigeon hole for his own clothing and other belongings under the watchful eye of an attendant; a wash room suitably equipped for removing coal dust and grime; the bath proper and the drying room. The bath proper is merely a shallow tank of hot water in which the bathers sit immersed to the neck, often by the hour. The "club life" centers mainly, however, in the drying room where the visitor can receive the attention of the barber or the chiropodist, drink innumerable cups of tea and gossip with his friends, devoting to the fluctuation in the exchange for copper cash the same seriousness which, in more exclusive clubs, is given to movements on the Stock Exchange.

It has been the experience of the Administration that it is better to make a nominal charge for the use of privileges rather than give them absolutely free. Consequently each visitor to a bath house is required to pay one copper—approximately 1/20th of a penny at the present rate of exchange—for the use of the bath house, a clean towel and the gift of a small tablet of soap.

Medical Department

The Administration has devoted attention to housing, to cleanliness, to the provision of good water, to sanitary services and to safe working conditions, in the belief that in matters of public health and of accident prevention is better than cure. Though the risk of accident has been reduced and the general health of the community greatly improved, accidents will happen and sickness has to be treated. This is the particular province of the Medical Department, whose services are available free to all employees of the Administration of whatever category, and to their families. They are also available to all destitute cases and to the employees of those local concerns who subscribe towards their upkeep. Those who desire to have more privacy than is procurable in the general wards are required to pay a small daily charge for the use of a private room.

At each mine and at Chinwangtao there is a hospital with a sufficient number of beds to deal with all local cases and a large out-patient department and dispensary. At Tongshan, the headquarters of the Medical Department, as of the Engineering Department at the mines, are situated the General Base Hospital and a special Senior Staff Hospital. To the General Base Hospital are, whenever possible, brought the most difficult surgical cases requiring the attention of the Principal Medical Officer, who is at the same time principal operating surgeon. This hospital of one hundred and thirty beds is consequently equipped with every device which modern science has contrived as an aid to operative surgery.

To these hospitals four thousand five hundred cases were admitted as in-patients last year, while one hundred and seventy-five thousand visits were paid to the out-patient department, thirty per cent, of which were charity cases unconnected with the Administration. Commodious as the hospitals are their capacity has proved inadequate in times of civil war when heavy fighting has taken place in the neighborhood of the mines. At such times it has been necessary to utilize temporarily other buildings which have been designed with such a contingency in view and for which spare beds and bedding are kept ready. Many hundreds of wounded soldiers, for whom no other medical attendance is available, have thus been saved from death or permanent disablement.

In organizing their medical services, the Administration have had a dual object in view. Their object has been not only to care for the sick and injured throughout the districts in which they are established, but also to utilize their hospitals as training institutions in which young Chinese medical men, who have recently taken their degrees, and Chinese nurses may gain the experience required to qualify them fully for private or other professional work. Under the Principal Medical Officer are four District Medical Officers and six Assistant Medical Officers, of whom two are foreigners and eight are Chinese. The nursing staff includes ninety male and eight female nurses, the latter working in female wards and in the Senior Staff Hospital. Of this staff all but three are Chinese. All recruits for the nursing staff are engaged on probation. They are required to attend a course of lectures, besides receiving practical instruction, and to pass an examination before being graded as assistant nurses.

Saving

No one could be more thrifty than the Chinese laborer. Paradoxically, no one could be less given to saving. A frugal upbringing in his village has taught him to find a use for every scrap of old material or discarded metal and to repair what anyone else would long ago have thrown away. He has not been accustomed, however, to any margin over and above the minimum required to support life, and whenever he has had a few spare dollars the opportunity for investment has been nil.

The laborer, is not, however, without ambition; his highest hope is to become possessed of the requisite cash to acquire a hawker's business, for manual labor is not more popular in China than in any other part of the world. The amount required for such a purpose appears to the laborer so vast a sum that he has no idea of ever accumulating it by steady saving. His hope is that by a run of luck in gambling a dazzling fortune of one or two hundred dollars may come his way. Cleverer men than he are always available to exploit him and it is no wonder, therefore, that most of the laborers' surplus earnings ultimately find their way into the pockets of the professional gambler.

It is as impracticable to prevent gambling in China by legislation and police action as it has elsewhere proved to prevent the consumption of alcoholic beverages by the same means. Gambling can only be kept in check—it can never be eliminated—by removing the incentive to gamble and by providing other and healthier means of recreation. It is on these lines, therefore, that the Administration has endeavored to tackle the problem.

To encourage steady saving the Administration has established a Provident and Gratuity Fund and a Savings Bank. What has been done in regard to providing a healthier means of recreation is described in a later section.

All direct employees of the Administration are eligible for membership of the Provident and Gratuity Fund, laborers and artisans after one year's continuous service, others on joining.

The general plan of this fund is that a member subscribes 5 per cent of his pay which accumulates at 6 per cent compound interest, and that on his retirement on account of age or disability or for any other good reason, the Administration adds a like amount to the employee's own contribution. The Savings Bank, so far as employees other than laborers are concerned, follows the usual plan of allowing a fixed rate of interest on deposits, the rate being 6 per cent. A special branch of the Savings Bank has, however, been opened for laborers designed to give the investor the zest of a gamble, without any risk of loss. The depositor is guaranteed the return of his deposit at any time without interest. Every month there is a drawing for prizes, the aggregate amount of which represents more than a reasonable amount of interest on the aggregate amount on deposit. Every month, therefore, each investor has a chance of what is to him a very big prize, yet he knows that he will never lose his money.

It must be admitted that these measures for the encouragement of saving have so far only attained a modicum of success.



A Staff Club



A Class Room



Aged Inmates of the Hospice



Youthful Inmates of the Hospice



A Sturdy Team



Loading Coal

Both the Provident and Gratuity Fund and the Savings Bank have proved attractive to the more intelligent and better educated employees. The ordinary worker has not in the vast majority of cases availed himself either of the one or the other. It seems possible that the feeling of unrest created by successive civil wars and by labor agitators is responsible for this meagre degree of success. It is to be hoped that, under more stable conditions, the wisdom of saving may be better appreciated.

Recreation

It has been explained in an earlier section that the bath house acts in a measure as the laborers' club room. For employees of higher status clubs have been provided at the various mines, at Chinwangtao, as well as at headquarters. The buildings, furniture and fittings are the property of the Administration and are maintained by the Administration, who also make grants in cash and in kind. The actual management of the clubs is in every case in the hands of a committee of members, who organize outdoor sports, reading rooms, libraries, and indoor games, to which, of course, must be added Chinese theatricals. To add to the attraction of these clubs the Administration arranges for a constant circulation of cinematograph films so that a new film is shown at every club every week free of charge. Needless to say, these entertainments are very well patronized.

For the laborers, theaters have been erected in the mines area where suitable films are shown and Chinese theatrical entertainments given. These latter are very popular with the men who often act themselves and even write topical skits for production before their fellows.

While on these lines something has been accomplished it must be admitted that the problem of providing means of recreation for the laborer is a difficult one. The manual worker does not yearn for more exercise in his spare time. If he takes any it is probably in the cultivation of his own court-yard, which is more profitable to him and, therefore, more attractive than any game. For people who cannot read it is very difficult to find suitable indoor recreation. Unquestionably the provision of suitable dwelling houses is working a great reform, but gambling is still prevalent and it seems likely to remain so until education gives the laborer the opportunity of amusing himself in a less hazardous way.

Education

However bitterly they may differ on other matters, all thinking men in China to-day are in agreement on this one point, that foremost among their country's needs is the spread of education. The Government has formulated a plan for providing compulsory education for a period of four years for all children of school age, whose number is roughly computed at forty millions. In practice, however, owing to political upheavals and the general impoverishment of the country, the plan is far from being carried into effect. The will is there, but the means are lacking; consequently such educational facilities as are made available to that eighty per cent of the population who live in villages are, with few exceptions, provided by private societies or individuals. In this work the Administration has borne its share.

Since its inception it has been the policy of the Administration to give assistance in cash, in kind or in both, to all well-conducted schools attended by the children of employees, the amount of the grant in aid being decided after inspection of the school at work. Within the last ten years the decision was taken, while continuing these grants, to take up educational work directly. A general scheme was then prepared which aimed at providing by successive stages a complete system of education of which the children of all employees at the mines and at Chinwangtao could avail themselves.

The basic idea was to provide at each place, first a lower primary school, next a higher primary school and, lastly, a middle school. Clearly it is undesirable even if it were possible, to contemplate the provision of education up to middle school standard for all the children of every grade of employee. To do so would convert the next generation into prospective engineers, clerks or accountants, for a very small percentage of whom could suitable appointments be found, leaving no candidates for employment in humbler capacities. Yet on the other hand, if education is to be made attractive it must ultimately afford to the children an opportunity of rising to a better position in life than that occupied by the parents.

The Administration has sought a way out of this dilemma by ruling that free education shall be available to all in the lower primary school, that in the higher primary it shall be available free to all who attain a certain standard on passing from the lower primary, to others on payment of a small fee, and that entry into the middle school in turn shall be determined by a similar process of selection. The intention is, of course, that the clever child of poor parents, equally with the clever child of parents who are better off, has the chance of rising in life without cost to the parents. The average child of poor parents is only given free an education which will enable him to do better the same work as his father and consequently to earn more.

The curriculum of the various schools conforms generally to that prescribed by Government. In the particular circumstances, however, special attention is given to vocational training and also to instruction in hygiene.

This scheme has not yet been carried out completely. Lower and higher primary schools for boys and girls have been opened at all mines and at Chinwangtao. A middle school for boys has been opened at Machiakow mine which is centrally located. All the school buildings are designed with a view to good ventilation and plenty of sunlight. The construction is substantial and durable, but as no money has been spent in order to secure architectural effect they make no great display. Particular attention has, however, been given to playing grounds and to the encouragement of games and physical exercises at all schools for both sexes. Though the program for building middle schools has not been completed there is already need for more accommodation for scholars in lower and higher primary schools. Numbers have increased from five hundred in 1923 to over two thousand three hundred last year and are still further increasing with the increase in the number of employees who have brought their families to the mines. The most urgent need is, therefore, for more primary schools. As the mining villages are scattered it seems likely that the Administration will have to aim eventually at having a school at each village.

The Administration's educational activities are in fact passing from infancy to adolescence. A special Department of Education has recently been created and placed under the supervision of an experienced Chinese educationalist as Director of Education, and under his guidance further steady progress is anticipated.

The Hospice

When an employee of the Administration is killed or injured by accident while at work on the Administration's premises compensation is invariably paid even though the accident may have been caused solely by the employee's own carelessness or disobedience of orders. Moreover, if an employee dies or is disabled from any cause an endeavor is always made to find employment for any sons of working age, if he has any, in order that the family may continue to be self-supporting. Nevertheless, in a community which consists largely of comparatively recent immigrants it is inevitable that cases should arise in which the old, the halt, the blind or young children are left destitute. It was for this reason that an institution known as the Hospice was founded in 1923 by the Administration acting in co-operation with the Peiping-Liaoning Railway, the Chee Hsin Cement Company and the local authorities.

The Hospice is intended to deal with two distinct classes of cases, each of which requires separate treatment. In the first place, there are aged persons and maimed persons of both sexes to be dealt with whose misfortunes render them incapable of ever earning a livelihood. For such persons the Hospice provides a permanent home. If they are capable of it they are given light work, more with the idea of providing occupation than of earning anything substantial towards their maintenance. In the second place, there are partially disabled adults who have been rendered incapable of earning their living in their former occupation but are capable of being taught a new trade, and there are children from babyhood to adolescence who have been left without parents or relations capable of undertaking their upbringing. For all such the Hospice is intended to provide a temporary home from which they can in course of time be sent out into the world to earn their own living and prove themselves useful members of society.

An institution which is designed to serve such objects must necessarily include a considerable number of buildings providing dormitories and refectories for the different sexes and different ages, together with the necessary bath houses, kitchens, laundries, class rooms, workshops, stores and offices. The area set aside by the Administration for the purpose extends to 80 mow (13 acres). About half of this area has now been covered with single storied buildings with ample space for light and air. The remainder is used for market gardening and stock raising, where under expert supervision boys may be given practical training in these pursuits. As the Hospice is a vocational boarding school for the young and a vocational training center for the partially disabled, it has been necessary to devote a considerable amount of the available space to workshops. These workshops, in view of the varying requirements of the inmates, have to cover a wide range of trades. They at present provide a training in such varied callings as shoe and harness making, spinning and carding, wicker work, dyeing, carpet making, and tailoring.

The Hospice has at present three hundred and eleven inmates. Already four hundred and twenty-one have passed out of the Hospice qualified to make their own way. Many are living in the mining area and are known to be doing well. Letters are constantly received from others who have gone further afield which tell the same story. The new institution must, therefore, be regarded as a proved success. Its usefulness can, however, undoubtedly be increased by adding still further to the range of trades in which instruction is given, and this is gradually being undertaken as space and instructors can be made available.

Efficiency of Labor

In an interesting and well-informed article* recently published under official auspices, the conclusion was reached that "the efficiency of a Chinese coal miner is about twenty times lower than in American coal mines." Numerous figures were cited in support of this general conclusion. Among the rest the writer noticed that in 1928 the average tonnage of coal produced in the Kailan mines per day per man of every category employed was only 9 per cent of the average American rate. It would appear at first sight that these figures justify the inference that Chinese laborers are deplorably inefficient or that the mining methods employed at the Kailan mines are extravagant, or both of these are factors contributing to the production of so poor a result. Is any such inference justified?

In considering this we must remember in the first place that the mining of a ton of coal is not a standard unit for measuring the amount of work done. The work involved in mining a ton of coal whether by mechanical means or by manual labor varies enormously with the physical conditions of the deposit mined. It is no exaggeration to say that, having regard to the characteristics of the coal and the physical nature of its deposit, the Kaiping coalfield would not be mined at all if it happened to be situated in the United States of America instead of in North China. It would not pay in that country, where vast quantities of better and more easily won coal are available, to exploit such a coalfield under any system.

Again, the labor employed in and about a coal mine in America is restricted to what is required for the operation of the mine. In a country which is fully developed industrially it is unnecessary and uneconomical for a coal-mining company to engage in the many ancillary enterprises into which, as already explained in this article, a mining company in China finds itself compelled to enter.

Lastly, we must bear in mind that in any industry the reduction of the number of men employed on any operation is not an end in itself; it is only a means to an end—the reduction of cost. Where labor is cheap and abundant it is uneconomical to introduce many labor saving devices which would pay where labor is more expensive. Indeed, in the present state of China, when development has been arrested by a series of civil wars, when millions are starving, when trade and commerce languish, when every movement of exchange is adverse, it may reasonably be claimed that, when there is any doubt as to whether it is more economical to introduce imported machinery or to continue to use more primitive methods employing a larger number of men, immediate humanitarian considerations will lead to preference being given to the solution, which does not throw men out of work.

It follows from these considerations that when comparing the output per man employed in America and in China we are not justified in drawing any conclusion as to the efficiency either of the management or of the efficiency of the individual laborers.

As to the former, the policy of the Administration has already been declared in an earlier section. As to the latter, we confidently predict that a test made under fair conditions would show that, regarded as a human heat engine—a machine whose function is to produce the maximum number of foot-pounds of work per unit of food consumed—the laborer of North China is the most efficient in the world.

*Chinese Economic Journal (Published by the Bureau of Industrial and Commercial Information, Ministry of Industry, Commerce and Labor, Vol. VI, No.5., May 1930. "Mining Labor in China" by Boris P. Torgasheff).

Building a New Shanghai

(Continued from page 351).

Island. A "Riverside Drive" of Shanghai will be created to link the International Settlement through Yangtszepoo. It is also planned by the City Government to convert the Confucian Temple and its extensive grounds near the West Gate of the native city into a public park. It is understood that special regard will be given to all buildings of historic interest within the grounds and such buildings will be preserved. The temple grounds comprise an area of 32 *mow* and will be provided with a library and a music hall.

It is important to mention in conclusion certain achievements of the City Government of Greater Shanghai in recent years. At a reception to press representatives of Shanghai, in January last, Mayor Chang Chun said that "46 kilometers of roads have been built, 101 kilometers of old streets have been repaved and improved, 37 miles of drains laid, 45 bridges repaired, 16 wharves constructed, and embankments of a length of more than 1,000 feet built. In order to meet the huge expenditure for construction work the Government has increased the budget for building and construction from $3,130,000 to $15,000,000."

It is believed that the development of the new Shanghai will go forward swiftly. When the city building plan is carried out Shanghai will be one of the world's most completely modernized ports, and it is needless to say, the city will not only be a great monument to new China, but it will also serve as an example for the encouragement of a general city-planning movement throughout the country.

Hongkong to have New Brewery

The Hongkong Brewers & Distillers Ltd., is a newly organized company with a capitalization of Hk.$3,000,000 which has acquired an extensive property near Shan Tseng Bay on the Kowloon side where a brewery plant is to be erected in the course of the year. The complete equipment for the new brewery has been ordered from Messrs. Skoda Works Ltd. and will be delivered in the latter part of the year when all the buildings of the plant are to be completed. It is expected that the plant will be ready to start manufacturing beer early in the summer of 1932.

As a part of the brewing equipment, an ice making plant has been ordered from Messrs. York Shipley, Inc. Both the brewing machinery and ice plant are to be operated electrically with current supplied over a long distance high tension line of the China Light & Power Co., Ltd. of Kowloon which is now is extending its power supply to reach all points of the British portion of Kowloon peninsula.

Chungking Waterworks

The city of Chungking, China, situated on the Kialing River, has a peculiar water problem which is soon to be remedied. The river level is far below the city level, and thousands of coolies have been engaged in carrying the water in buckets from the Kialing to Chungking's business and residential districts. Under a new construction project, water will be pumped to a hill one and a half miles away and piped through the city.



General View of New Kowloon Power Station of the China Light and Power Co. (1918) Ltd.

New Kowloon Power Station of the China Light and Power Co., (1918), Ltd.

by C. STRATFORD.

OCCUPYING a prominent position on the foreshore of Kowloon Bay, the Generating Station of the China Light & Power Co., (1918), Ltd., is one of the conspicuous landmarks noticeable on approaching Hongkong from the Eastward entrance to the harbor. The Company is a Hongkong Undertaking supplying electricity to the Kowloon Peninsula and New Territories and the generating station was originally in Chatham Road, Hung Hom, the plant in 1909 consisting of four 100 kw. British, Westinghouse sets direct driven by producer gas engines, generating 60 cycle two phase current at a voltage of 2,000.

This plant was at a later date superseded by two 750 kw. British, Thomson-Houston sets driven by steam turbines, generating at 2,200 volts three phase 60 cycles having auxiliaries and switchboard by the same makers.

The boiler plant at that time consisted of three Babcock & Wilcox Water Tube Boilers each of 9,000 lb. capacity and with heating surface and grate areas of 2,690 and 60 sq. ft. respectively, the waste gases being dealt with by a Green's economizer of 180 tubes.

In 1920, a new site was obtained at Taiwan, on the foreshore of Kowloon Bay and on completion of the Station building, two 1,000 kw. Westinghouse sets were installed together with an 18 panel switchboard and two Babcock & Wilcox boilers each of 10,500 lb. capacity, with heating surfaces and grate areas of 3,051 and 80 sq. ft. respectively. A new Green's economizer of 180 tubes was also erected at the same time.

The new station having been put into commission, the two 750 kw. B.T-H. sets were removed from the old site and re-erected at the new station, and at the same time the three original Babcock & Wilcox boilers were dismantled and re-erected at the new station with the addition of a fourth new unit of the same size.

The peak load which was recorded as 1,070 kw. in 1920, rose to 3,400 in 1925 and an additional 3,000 kw. B.T-H set was ordered and put into commission in the following year.

The boiler plant was also augmented by the addition of four new Babcock & Wilcox boilers, each of 20,000 lb. capacity, with a heating surface of 4,424 sq. ft. and 112 sq. ft. grate area. These were built in batteries of two and fitted with chain grate stokers and forced and induced draft; a new Green's economizer of 252 tubes being also added.

A Metropolitan-Vickers 5,000 kw. set was erected and put into commission during 1927, and for the twelve months ending September 30, 1928, the output was 13,597,929 B.O.T.U., the maximum load recorded for that period being 4,200 kw.

During 1926, Metropolitan-Vickers Ironclad Switchgear of the cubicle type was installed for the control of all generating sets, together with a remote control board of the desk type, and there were also added two direct current turbo house sets each of 50 kw. capacity by Messrs. Greenwood & Batley, to take care of the turbine room and boiler house lighting and supply current for operating the oil switches.

For the year ending September, 1929, the annual output was 16,573,476 with a maximum recorded load of 4,750, and in view of future developments, Messrs. Preece, Cardew & Rider were appointed as Consulting Engineers, and it was decided to change over the system from 2,200 volts 60 cycles to 6,600 volts 50 cycles, in order to conform with standard British practice.

The work of changing the consumers voltage from 110/200 to 200/350 was commenced during the latter part of 1927, and is now practically complete.

During 1926 an additional area of 72,000 sq. ft. adjacent to the present generating station site was purchased and has since been reclaimed and a sea-wall built, and this area was recently supplemented by an additional 160,000 sq. ft. so that the generating station site to-day approximates 7½ acres with a marine frontage of 1,150 feet.

THE NEW POWER PLANT OF THE CHINA LIGHT AND POWER CO., LTD.

ON KOWLOON BAY, OPPOSITE HONGKONG



British Thompson-Houston Turbo Generating Set, 5,000 kw.; 6,600 v.; 50 cycles



Metropolitan-Vickers Turbo Generating Set, 5,000 kw.; 2,200 v.; 60 cycles



1,800 kva. 2,200 v. 60c./6,600 v. 50c. Frequency Changer



Two Greenwood & Batley D.C. Turbo house sets of 50 kw. each



Control Panels and Exciter Pedestals for the Remote Control Reyrolle Switchgear Shown Below

During 1930, both the original 1,000 kw. sets were sold, and at the same time two of the 10,500 lb. boilers removed to make way for the erection of a 40,000 lb. Thompson boiler. This unit now in course of erection is fitted with chain grate stokers by the Underfeed Stoker Company, the balanced draft system being used and furnaces designed to burn Hongay dust coal.

A 528 tube Green's economizer is also being added in conjunction with this boiler; this unit being of sufficient capacity to deal with gases from the 40,000 lb. boiler and an additional unit of 30,000 lb. to be added at a later date.

The generating station plant now comprises the following units:—

Two B.T-H sets each of 5,000 kw. capacity 6,600 volts 50 cycles
One M-V set of 5,000 kw. capacity, 2,200 volts 60 cycles
One B.T-H set of 3,000 kw. capacity, 2,200 volts 60 cycles
Two B.T-H sets of 750 kw. capacity, 2,200 volts 60 cycles
Two Brush Co.'s Frequency Changers 2,200 v./60 cycles—6,600 v./50c. each of 1,500 kw. capacity
Two Greenwood & Batley Turbo Generator D.C. House Sets and
One Motor-Generator Set, each of 50 kw. capacity for Station lighting and operation of oil switches.

Each of the two new 5,000 kw. sets consists of a horizontal steam turbine of the impulse type directly coupled to a three phase alternator and exciter, designed to work at a steam pressure of 190 lb. per sq. in. at the stop valve, superheated to a total temperature of 584°F, and exhausting into a condenser maintaining a vacuum of 27.75 ft. at full load.

The surface condensers are of the two pass type by The Metropolitan-Vickers Co., Ltd., each having a cooling surface of 10,000 sq. ft., and will maintain the vacuum above-mentioned under full load conditions when supplied with 7,500 gals. of sea water per minute at a temperature of 85°F.

They are provided with duplicate sets of air pumps of the steam ejector type consisting of primary and secondary ejectors and surface type coolers.

Each set is supplied with an independent circulating pump running at 580 r.p.m.; a suction pipe line being laid under the condenser room floor to a concrete pier on the seawall. The intakes are fitted with a perforated strainer and foot valve, and rotary strainers manufactured by Bailey & Jackson are fitted on the discharge side of the circulating pumps.

Duplicate condensate pumps are fitted to each set, each pump being driven by a motor of the squirrel cage type running at 1,440 r.p.m. fitted with Ellison starting gear.

The alternator stator windings are fitted with a six point temperature detector having elements fixed in the windings and connected to a Cambridge indicating thermometer. The air cooling of the alternator is on the closed system with an emergency intake and discharge to the external air, and consists of a system of tubes cooled by sea water taken from the condenser circulating water system; alarm devices being fitted in case of an abnormal temperature of the air at the alternator outlet being reached.



Remote Control Reyrolle Ironclad Switchgear: Rupturing Capacity 150,000 kw.



Reyrolle Switchgear; 12 Ironclad units of remote control type

CHINA LIGHT & POWER TRANSMISSION LINES

Callender's Cable and Construction Co., Ltd.



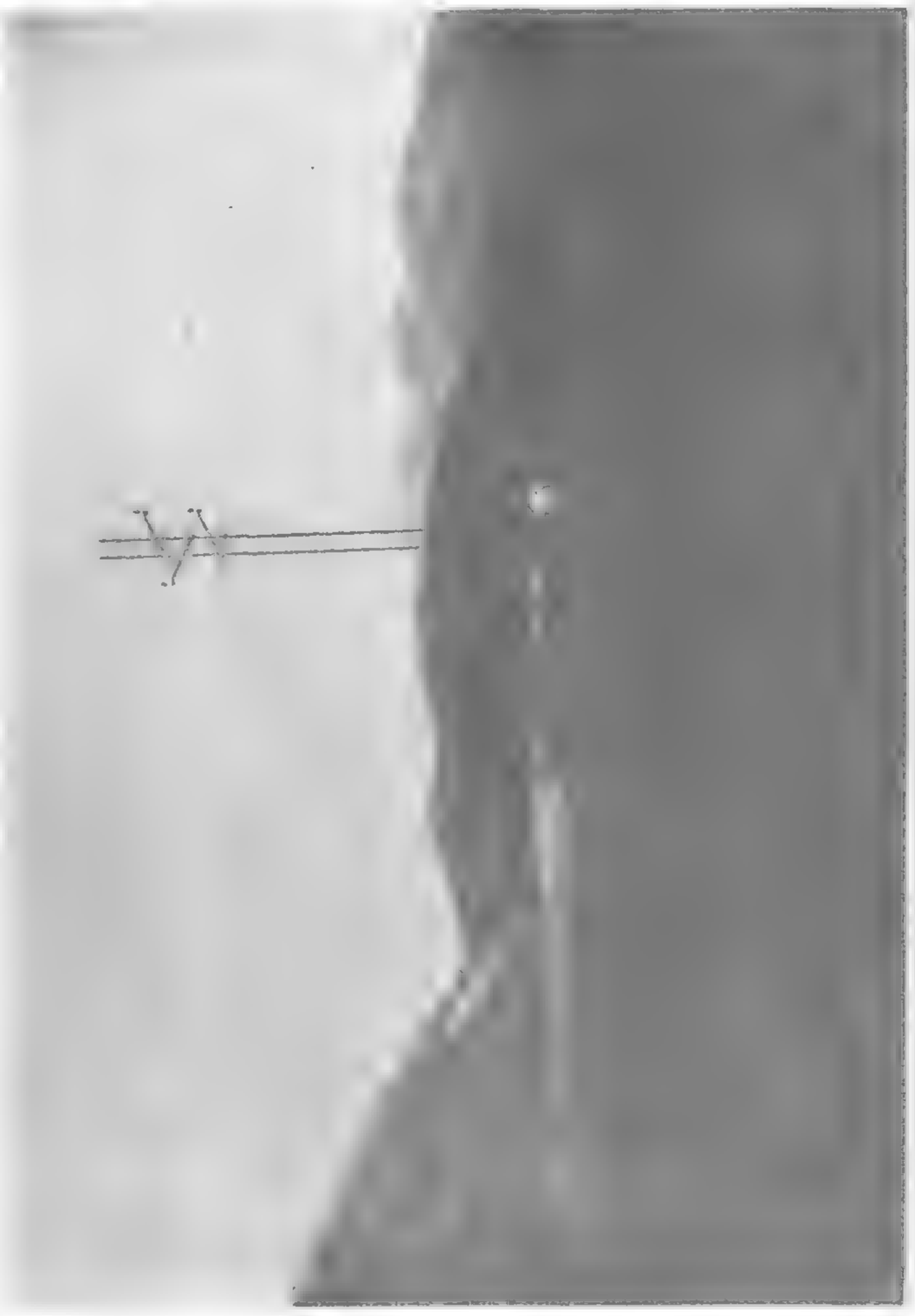
Line Passing Over Smuggler's Ridge, Showing Typical Country Crossed and Branch Tower



Subsidiary Line Pole, passing through Village



Uplift Type Towers in Pineapple Pass



Small Base Pole in Rice Field

Each of the exciters consists of a double unit made up of main and auxiliary exciter, directly coupled to the end of the alternator by means of a flexible disc coupling, the auxiliary exciter exciting the main exciter field, thus ensuring stability of the main exciter under all conditions of operation.

The alternator fields are provided with field suppression switches, and an auxiliary switch in the operating solenoid circuit of the main circuit breaker to prevent closing of the main solenoid when the field suppression switch is opened.

A Tirrill voltage regulator equipment is provided for voltage control of either set.

The main switchboard consists of two portions, the old comprising a 21 panel board, hand operated, for controlling the 2,200 volt feeders, together with a Metropolitan-Vickers desk control for operating the 2,200 volt switchgear controlling the old generating sets and the low voltage side of the frequency changers, and the new Reyrolle switchgear consisting of 12 ironclad units of the remote control type for controlling the two new 5,000 kw. sets, frequency changers and external circuits, these being operated from a remote control board of 11 panels. Each circuit breaker is of the oil break type with independent hand operation for emergency use, normal operation being by means of 125 volt D.C. current supplied from the turbo generator house sets.

The busbars are in duplicate and fitted with an indicating device at the switches and control panels.

All current and potential transformers are either oil or compound immersed. Earthing switches are provided, also excess pressure dischargers of the oxide film type to relieve the system in the event of any excessive rises of pressure either between phases or to earth.

There is in addition a three panel D.C. board to handle the two turbo house sets and the motor generator set for station lighting.

Coal is received alongside the sea-wall ex-lighters, coolie labor being used for the transportation into bins. These are eight in number each holding 400 tons and are located close to the boiler room; the coal being handled by coolies from the bins to the conveyor pit. A bucket conveyor of 20 tons per hour capacity elevates the coal from the pit to the boiler fuel hoppers, from whence it falls by gravity to the chain grates; the conveyor also disposes of the contents of the ash pits, discharging same into a bin at ground level, the ashes being subsequently removed by lighter.

The fuel used is a mixture of bituminous and semi-anthracite dust obtained from Japan and French Indo-China; the coal being mixed at the time of dumping in the conveyor pit.

The feeders from the Generating Station consist of 3-core paper insulated, lead sheathed and armored cables laid direct in the ground and covered with a protective tiling to minimize the risk of accidental damage.

The 2,200 volt existing



Typical Angle Tower: Also used as a Temporary Watchman's Shelter for the construction dump



Typical Angle Tower at Road Crossing near Beacon Hill Tunnel



Typical Straight Line Tower overlooking Tsun Wan Bay

cables are gradually being superseded by cables of the 6,600 volt class, which will eventually serve all sub-stations.

These are located at various points in the Peninsula, spaced approximately 1,000 yards apart, the supply being transformed down to 346/200 for consumers' supply, control being effected by switchgear of the Reyrolle armorclad type.

By arrangements with the Hongkong Government, a 22 k.v. transmission line is being erected in the New Territories. The scheme commences at the Kowloon Tong sub-station from whence a 6,600 volt underground cable carries the current through the Beacon Hill Railway Tunnel. At the North end of the tunnel an outdoor sub-station steps up the pressure to 22,000 volts and from that point the overhead transmission line commences.

The scheme, which, when completed, will make electricity available in all villages and towns of importance throughout the New Territories, comprises a 22,000 volt line to selected positions where the voltage is transformed down to 6,600. Subsidiary lines operating at this lower pressure will supply the villages and market towns through transformers which will reduce the voltage to 350/200 for domestic supply. The nature and size of these transformers will, depend upon the load demanded, and where this is small the transformer and switchgear will be mounted on a pole but, for the larger market towns, sub-stations will be erected feeding on to a low tension distribution network.



Line Going up the Shin Mun Valley showing typical country crossed

The 22,000 volt line is carried on lattice steel towers, galvanized throughout, every bolt being fitted with a spring washer to prevent the nut working loose with the vibration caused by the wind in the heavily strained conductors. The towers were supplied "knocked down" in bundles of a suitable size and weight for coolie transport and were bolted together on site. They are of the same general design as that approved by Sir Edwin Lutyens for the "Grid Scheme" at present being constructed in England and are as graceful and artistic in appearance as it is possible to make such utilitarian structures. The towers are designed to give a factor of safety of two and a half against overturning under typhoon conditions, but owing to the heavy nature of the soil in which they are erected this figure has been greatly exceeded.

There are two main types of towers, those for use in straight line positions being much lighter than the towers designed for positions where the line changes its direction and where, in addition to wind stresses, the pull of the wires tends to uproot the structure. The straight line type, which are only about four or five feet square at ground level, expand to about nine feet square seven feet below the surface and the foundations consist of two long flat plates, parallel to the conductors, with earth well packed below them. This makes a very satisfactory foundation and has the advantage that no concrete is required. At angle positions stronger foundations are needed and here the four legs are carried down independently with large reinforced concrete "grillages" well buried in the ground.

The line passes over exceedingly hilly and broken country for the greater part of its length, and under the conditions it has been found impossible to standardize the spans. Over paddy fields and flat country the average span is 460 feet, but in the hills these are increased to an average of 700 feet as the line is usually on a hillside where the towers have to be erected on spurs. The tallest tower used is approximately 50 feet high.

Each conductor consists of a seven strand cadmium copper cable having a breaking strain of not less than 7,800 lb. each wire being .124 in. diameter. The conductors are strained up to give a minimum factor of safety of two under worst typhoon conditions and it is interesting to note that under construction conditions the wires have to be pulled up to a tension of about 3,000 lb. which only gives a sag of about four feet on a 500 feet span. The conductors are carried on two disc suspension insulators on straight line towers and similar insulators, with slightly different fittings, are used at angles and terminals. Owing to the humidity of Hongkong, at certain seasons, the insulators are designed for a working pressure of 33,000 volts, and in addition to the conductors a continuous galvanized steel earth wire is fixed to the top of each tower. This helps to protect the conductors against lightning and also ensures that each tower is securely "earthed" in the event of leakage from a damaged insulator. Lightning arresters are also fitted at certain points along the route to protect the transformers and switchgear.



Start of the Line at Beacon Hill Sub-station

The main line runs from Beacon Hill Tunnel, up the Shing Mun Valley, over Lead Mine Pass to Taipo and then follows the railway line to near Fanling. At two points branch lines are taken off; one to feed Tsun Wan and the Texas Company's new oil installation and one to Un Long. Special towers, fitted with switchgear, have been erected at the junctions to sectionalize the main line for overhauls or repairs.

The design, which conforms to the Electricity Commissioners Regulations, also the supply and

(Continued on page 381)



A San-Kyu train which travels 65 miles an hour at the maximum and 34 miles an hour on average

The San-Kyu Electric Railway of Osaka

By OSAMU ITO

THE Sangu Kyuko Dentetsu Kabushiki Kaisha, or, in homely English phrasing, The Pilgrim to the Grand Shrine Express Electric Railway Company, is a newly completed rapid transit system which has several remarkable features. The line was opened recently between Osaka and Uji-Yamada, site of the Ise Grand Shrine, which is dedicated to the Imperial Ancestor of the Japanese Empire, and which every year is the goal of thousands of devout pilgrims. Commonly this railway is to be known as the San-Kyu Line.

Of all the many high speed electric railway services being operated in all parts of Japan it perhaps may be said that the San-Kyu is the fastest line in the country. Its trains attain a maximum speed of 66 miles an hour and an average speed of 34 miles an hour is maintained for distances as great as 100 kilometers.

Another outstanding feature of the San-Kyu railway is that it passes through the longest electric railway tunnel in the country. Another particular in which the railway is unique is that it is the only electric system in the Far East having at one of its substations three mercury rectifiers, the aggregate total capacity of which amounts to 6,000 k.w. In listing distinguishing features of this system it may be mentioned further that its trains are equipped with the A.B.F. multiple unit control equipment, and it is due principally to this safety device that trains may be operated smoothly at tremendous speeds despite the circumstance that the line traverses many steep inclines.



The San-Kyu Railways Station at Uji Yamada

The particular value that the San-Kyu service affords is that it enables people to travel from Osaka to the "City of God," as Uji-Yamada often is called, pay homage at the Grand Shrine and return to Osaka within the period of a single day. Hitherto the only service available was over a more or less inadequate steam railway, the Sangu branch of the Imperial Government Railway, running between Osaka and Uji-Yamada and taking two days for the round trip. Over the San-Kyu electric line one may leave Osaka in the morning and return in the evening. The actual traveling time over the steam railway was ten hours. This is reduced to four hours and twenty minutes over the San-Kyu line.

Primarily the San-Kyu system was built as a feeder for the Osaka Denki Kido K.K. of the Osaka Electric Tramway Company,



Inside view of a San-Kyu Railway Carriage

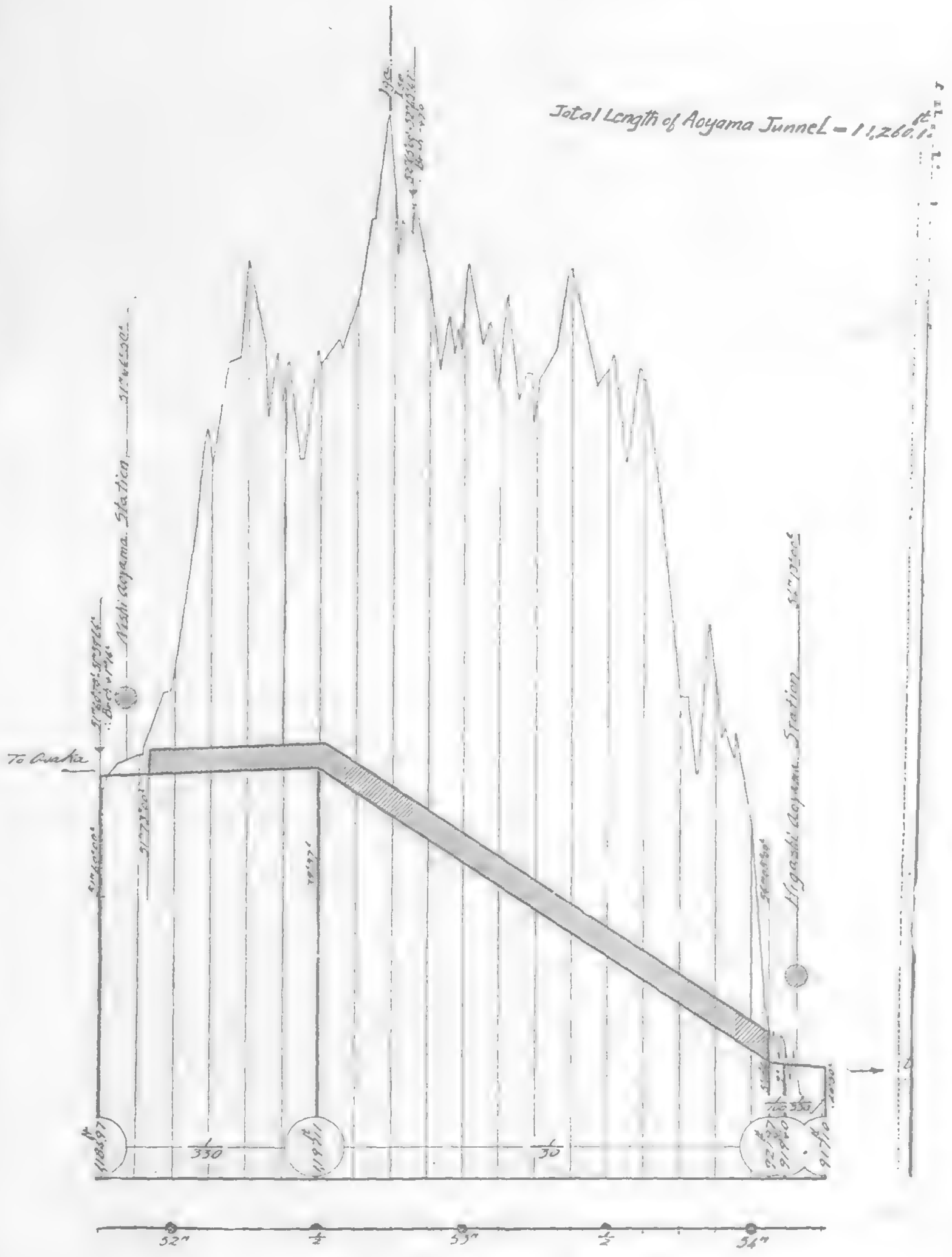


Compartment of a San-Kyu Railway Carriage

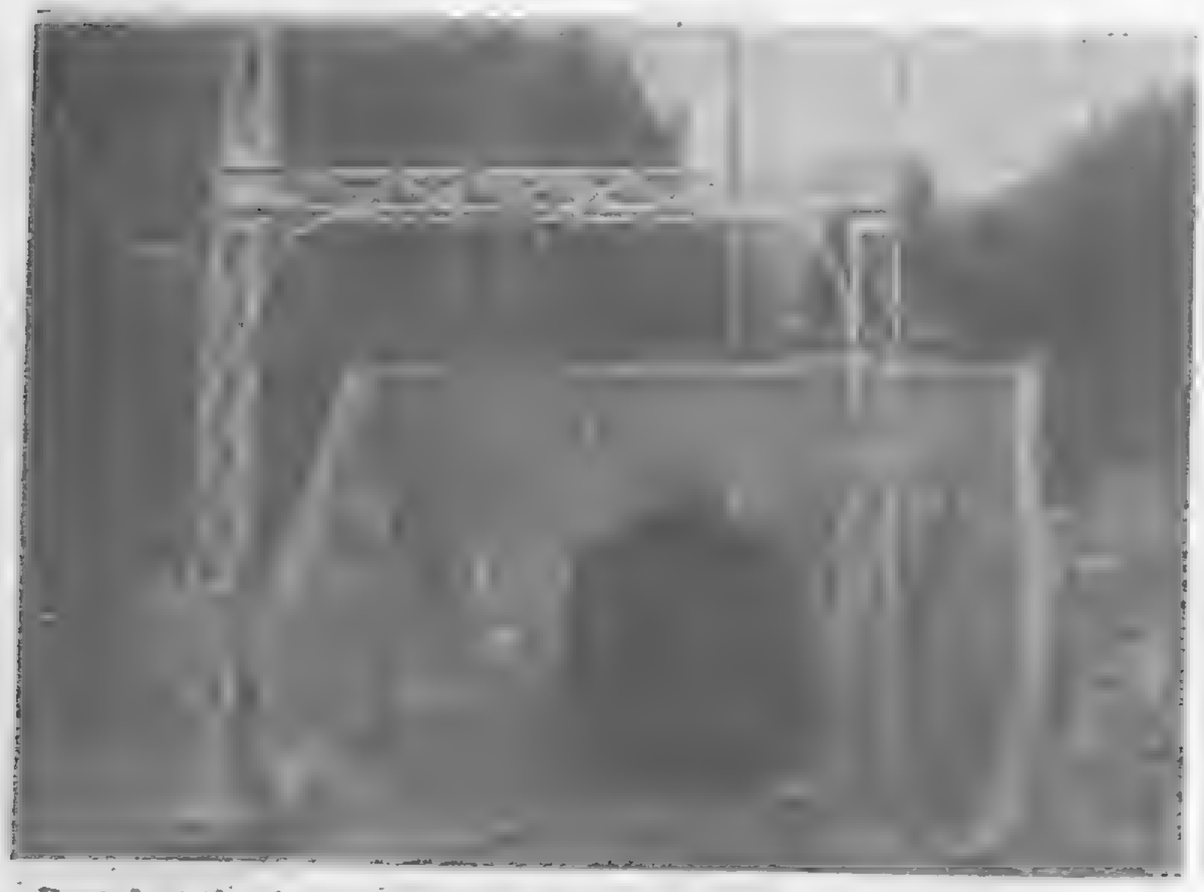
Ltd., familiarly known as the Daiki line, and as the San-Kyu is amalgamated with the Daiki company it has no terminal of its own in Osaka but starts from Sakurai Station, Nara Prefecture on the Daiki Line. Through traffic between Osaka and Uji-Yamada is maintained, however, as San-Kyu trains pass over the Daiki tracks from Sakurai to Osaka, a distance of 39.8 kilometers. The distance between Sakurai and Uji-Yamada, marking the main line of the new railway, is 96.9 kilometers. The distance between Osaka and Uji-Yamada, *via* the Daiki Line, therefore totals about 140 kilometers.

The San-Kyu Company is capitalized at Y.30,000,000 of which Y.22,500,000 has been paid in. Outstanding loans total Y.10,000,000. The cost of construction stands at Y.35,000,000. In addition to the main line the system includes a branch line that starts at Nakagawa to reach Kuwana and eventually Nagoya in the future. About half of the 96.9 kilometers of the main line, the central portion between Nabari and Nakagawa, (41.7 kilometers), is single-track. Both ends of the main line, between Sakurai and Nabari, (27.5 kilometers), and between Nakagawa and Uji - Yamada, (27.7. kilometers), where the traffic volume is heavier, are double tracked. The Daiki Line system has been operated with a voltage fixed at 600 volts, but in effecting the connection with the San-Kyu line at Sakurai the voltage has been elevated to 1,500 volts between Sakurai and Osaka to conform with electrical requirements of the San-Kyu system. Extra platforms also have been supplied at the Osaka terminal of the Daiki Line for the exclusive use of San-Kyu passengers. The San-Kyu system has adopted the standard gauge and uses 75 lb. rails throughout except between Kamitsu and Eta where 100 lb. rails are used. At crossings where traffic is congested the electric current is insulated with Weber joints.

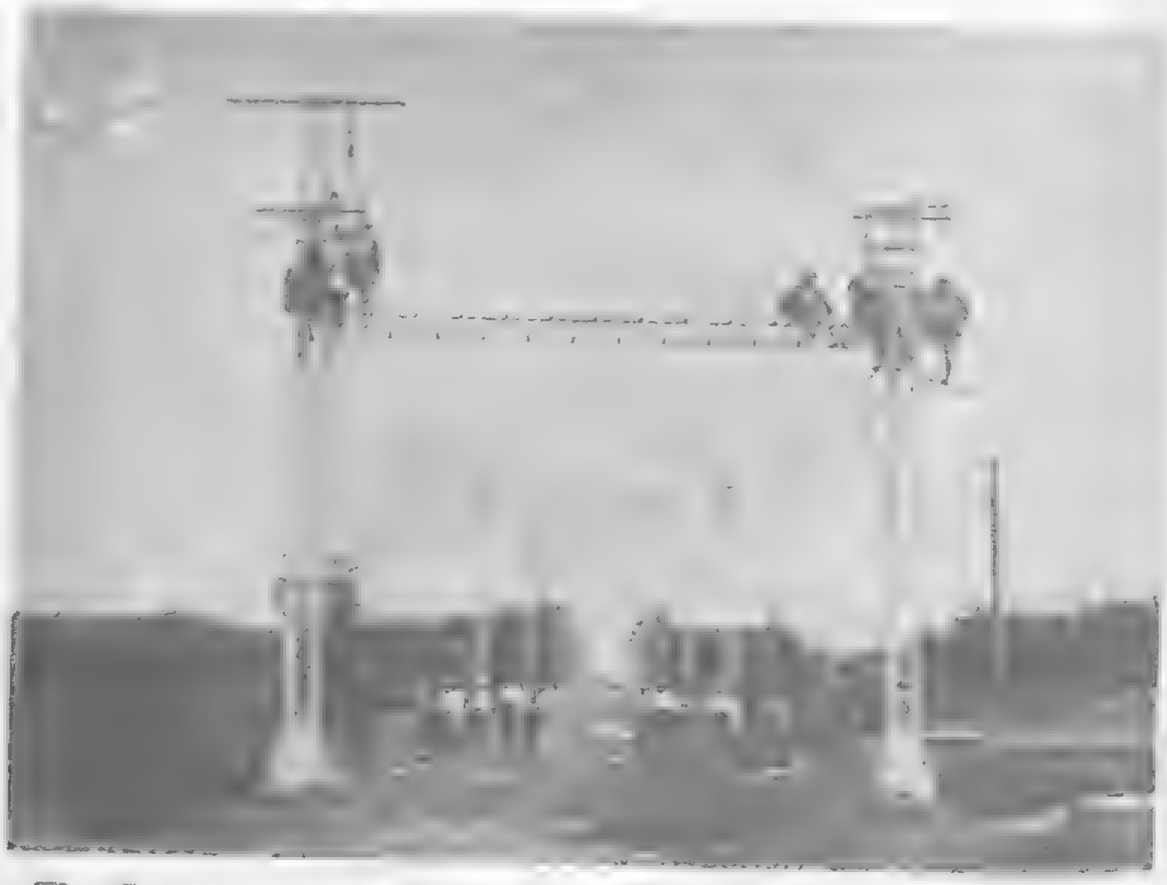
In order to insure high speed operation of trains the San-Kyu main line was built to follow as



Profile of Aoyama Tunnel



Portal of the Aoyama Tunnel built by the Obayashi-Gumi Builders at a cost of Y.3,000,000



The San-Kyu System Under construction. Mt. Asakuma in the distance

closely as possible a straight line and by reason of this the construction of the line entailed many complex and intricate problems of engineering, particularly in the mountainous region that is traversed where hills had to be cut and tunnels drilled. Many steep inclines were levelled and many fills had to be made at points to elevate the roadway. The fact that the difference between the highest and lowest points of the San-Kyu system is more than 360 meters indicates the difficulties that the builders of the line rucmounted. The highest point is located at the western entrance to the Aoyama tunnel where the line is 364.9 meters above sea level, while the lowest point is in the neighborhood of Nakahara station where the line is only 1.7 meters above sea level.

The ground space required for the construction of this railway totals 2,525,265 square meters, including 2,193,854 square meters required for the railway zone, 299,125 square meters for station sites, and 30,286 square meters for the electric substation sites. The quantity of earth removed in connection with cutting through hills and tunnels amounted to 2,310,244 cubic meters and the quantity of earth used in elevating the ground to level inclines totalled 2,593,355 cubic meters. The stone walls built cover a space of 51,305 square meters, including those constructed along rivers and highways.



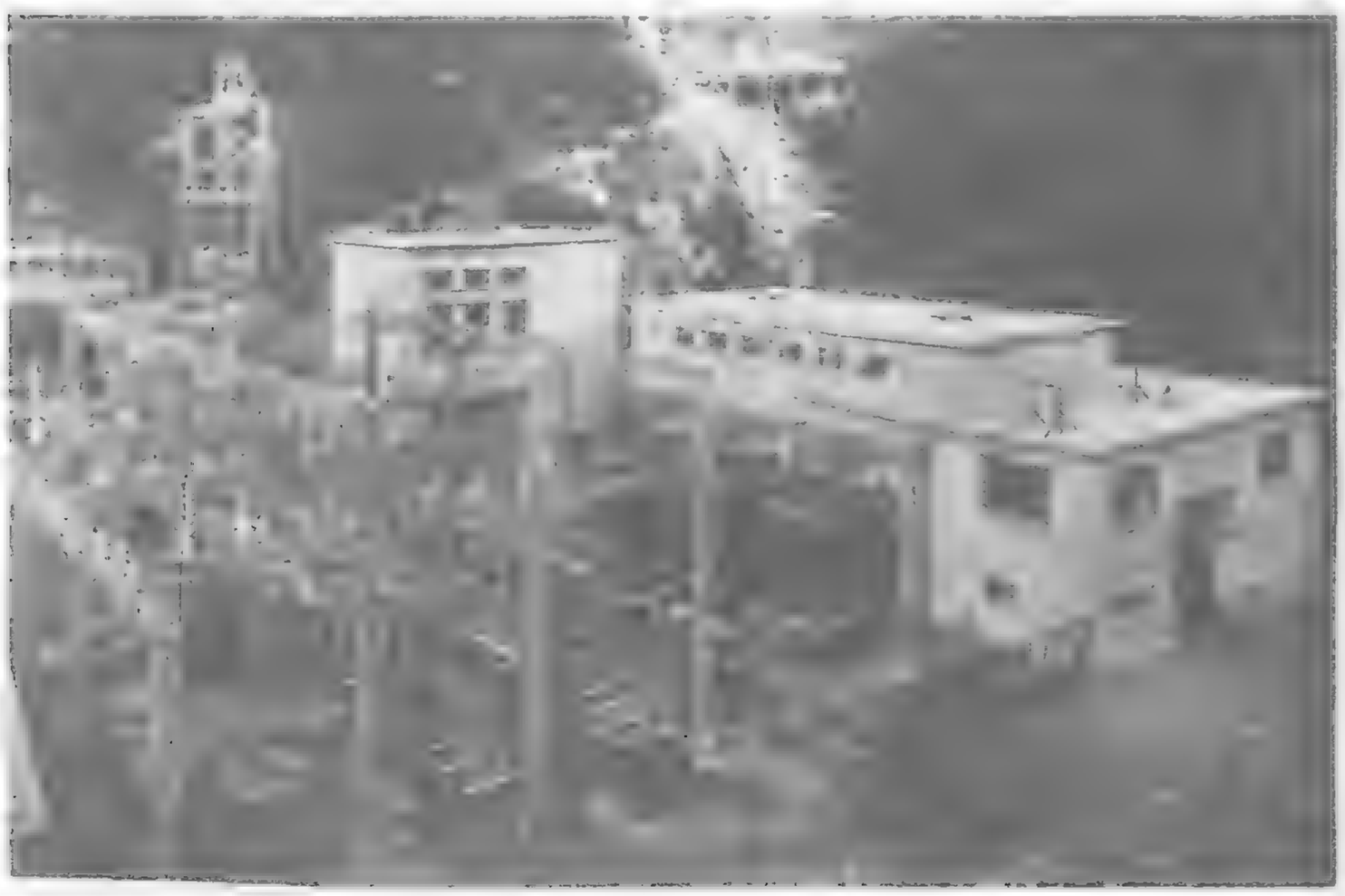
Three mercury rectifiers, 1.500 volt, 2,000 kw. each, installed at Nunobiki-Substatio

There are 23 regular stations in addition to five minor stops along the San-Kyu Line. Of these are three stations where the freight and passenger services are connected with the Government railway within the same station yards. These stations are at Sakurai, Matsuzaka, and Yamada.

The Uji-Yamada station is a three-storied reinforced concrete building constructed by the Obayashi-Gumi builders at an estimated cost of Y.1,300,000. The cost, however, included that of building an elevated line for a short distance from the outskirts of the city to the station.



Switch-board for mercury rectifiers at Nunobiki Substation



General view of Nunobiki substation

There are 132 bridges along the line. The aggregate total length of these bridges amounts to 3,597.8 meters, including 96.9 meters of box culverts. The longest bridge is that spanning the Miya-gawa of Ise, its length being 436.78 meters.

The Kanda-gawa bridge in the neighborhood of the *Murouguchi* station is 149.5 meters long and the *Sangenya bridge near Kamitsu station* is 96.9 meters long. Both are built over gorges and both are 24 meters high. They are of reinforced concrete construction. In addition to these bridges, there are 230 small open and closed culverts.

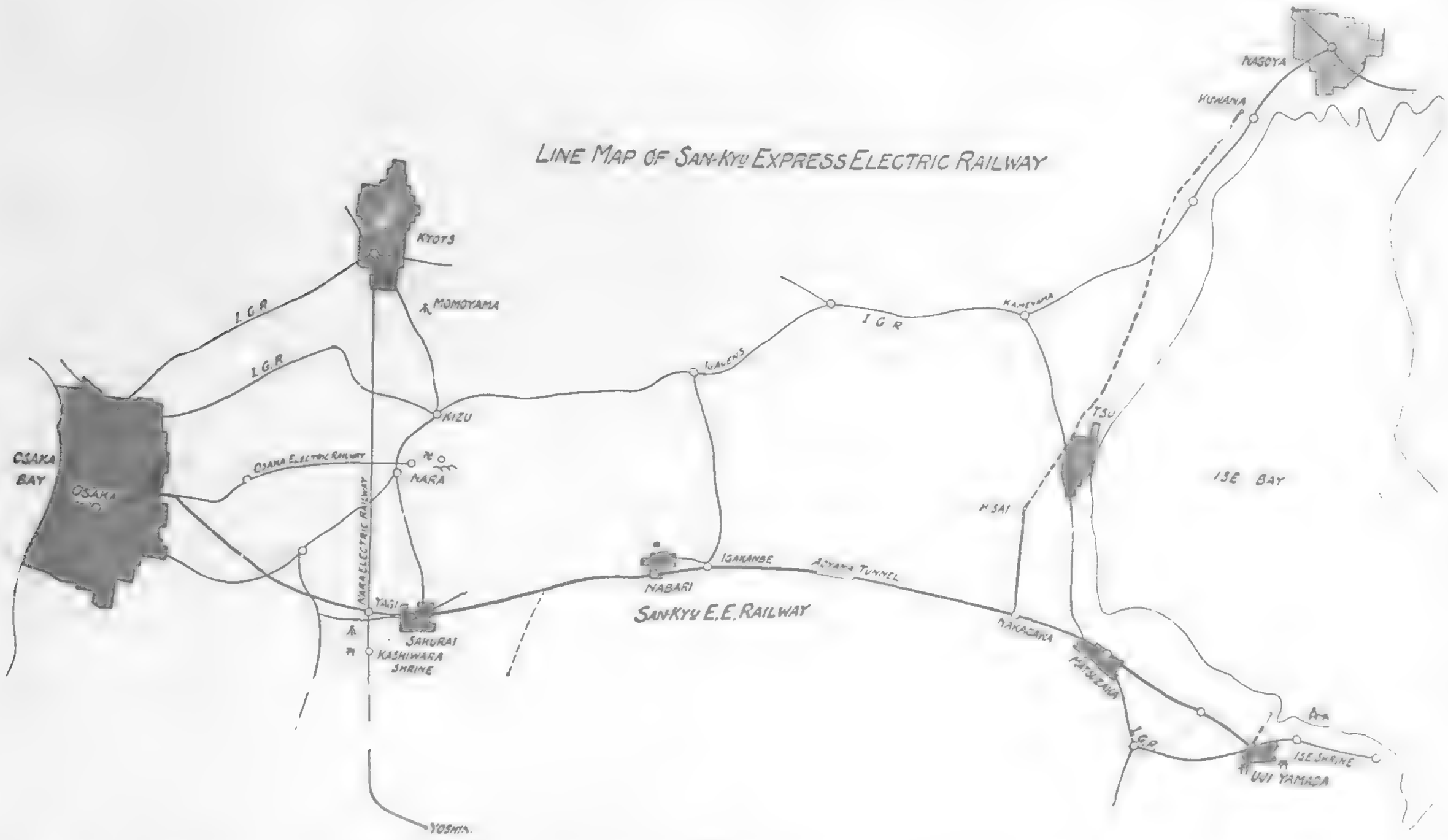
The steel materials used for the construction of these bridges and culverts weigh 5,080 tons, including "I" beam steel, deck steel plate girders (half through), through girders, three main girders, continuous steel plate girders, and so forth.

The line intersects with the Government railway at eight places and crosses it at six places by means of land bridges. It also crosses national and prefectural highways at 29 places.

The mixing percentages of cement, sand, and ballast for various kinds of concrete used in the construction work are: reinforced concrete, 1 : 2 : 4; body concrete, 1 : 3 : 5; foundation work, 1 : 3.5 : 6 respectively.

There are 16 tunnels on the line. Their aggregate total length is 9,538 meters. Of these, the length of the Aoyama Tunnel, (single tracked), is the longest, extending to 3,432 meters. In fact, this is the longest tunnel on the operated railways in Japan.

The construction of the Aoyama tunnel was started in March, 1928, at an estimated cost of Y.3,000,000, the Obayashi-Gumi builders undertaking the work. It was completed in August, 1930, much earlier than was generally expected, and owing to the fact that this tunnel, which had been regarded as the knottiest problem of the entire scheme, was thus easily completed, the market quotation of the com-



pany's shares registered sudden and unexpected advances. Of the 16 tunnels, 12 are single tracked, the remaining four being double tracked.

Electrical Equipment

The San-Kyu Line buys electric power from the Godo Denki K.K. (The Godo Electric Co., Ltd.) in the Ise district (Mie Prefecture). It receives the supply at the Nakagawa receiving station, the current being three phase, alternating current, 60 cycle, 77,000 volts, which the Nakagawa station reduces to 33,000 volts.

In the Yamato district, (Nara Prefecture), the line is supplied with power from the Daiki Line in two different ways, *viz.*, three phase, alternating current, 33,000 volts, and direct current, 1,500 volts, which obviously is for the San-Kyu trains operating on the Daiki tracks near the Osaka terminal.

All the substations along the line are connected with each other by 33,000 volt, two circuit transmission lines, so that each one of them may both transmit and receive the power one from the others. There are five substations where both indoor and outdoor systems are in use. By means of 33,000 volt transformers the current is reduced to the required voltage and then further transformed into direct current either by rotary converters or by mercury rectifiers. The direct current system is operated in parallel. All the substations are automatically operated. Salient features of these substations are as follows:

Sanbonmatsu substation: (maximum capacity, 6,000 kw.) three transformers of 21,000 k.v.a. each; three shunt rotary converters, 1,500 volts, 2,000 kw. each.

Minohata substation: (maximum capacity, 4,000 kw.) two transformers 21,000 k.v.a. each; two shunt rotary converters, 1,500 volts, 2,000 kw. each.

Nunobiki substation: (maximum capacity, 6,000 kw.) three transformers for mercury rectifiers of 2,940 k.v.a. each; three mercury rectifiers, water-cooled cylindrical iron vessel type, of direct current 1,500 volt, 2,000 kw. each.

Nakagawa substation: (maximum capacity, 6,000 kw.) three transformers of 1,100 k.v.a. each; three shunt rotary converters of 1,500 volts, 2,000 kw. each.

Myojo substation: (maximum capacity, 4,000 kw.) two transformers, 2,100 k.v.a., each; two shunt rotary converters, 1,500 volts, 2,000 kw. each.

Nakagawa receiving station: six outdoor single phase, 3,000 k.v.a. transformers.

Of the foregoing substations, the Nunobiki substation is equipped with three mercury rectifiers, their combined capacity amounting to 6,000 kw. It is claimed that there is no substation in the Orient which is equipped with mercury rectifiers of such large capacity.

All the substations are two-storied, reinforced concrete buildings, both fire and earthquake proof. These substations are connected one with the other by two circuit lines of 2.3 milimeter 19 wires stranded hard drawn copper wire and 2.57 milimeters 22 steel core aluminium cable, which are used mainly at such places where the span between the transmission line towers is long.

The transmission lines are attached to the iron side poles along the tramway between Sakurai and Haibara, but an independent transmission system has been constructed between Haibara and Nakagawa, consisting of iron towers which have such arrangement that the present voltage can be elevated to 77,000 volts.

The feeder line is 1,500 volt single trolley overhead system. The aluminium cable is used between Sakurai and Nakagawa, but hard drawn copper wire is used between Nakagawa and Yamada.

There are two kinds of wires in use. The one is 3.5 milimeter 61 stranded and 4.0 milimeter 61 stranded bare hard drawn aluminium wire, and the other is 3.2 milimeter 61 stranded and 2.9 milimeter 61 stranded bare hard drawn copper wires. These wires are used in accordance with local load conditions.

The single catenary compound system is adopted for the tramcar line; the main messenger wire is 4.5 milimeter 7 wires stranded lead hard drawn copper wire, and the auxiliary messenger wire is 2.9 milimeter 19 wire stranded bare hard drawn copper wire. The tramcar line is 110 square milimeter grooved hard drawn copper wire.

Rolling Stock

The rolling stock of the San-Kyu Line consists of 35 passenger motor carriages, including eight which are equipped with compartments and special luggage rooms, and 17 trailer carriages for the through service. For local service, there are eight passenger motor carriages. In addition, there are four uncovered freight motor cars and eight freight trailer cars. Thirteen covered freight motor cars and trailer cars are being built.

(Continued on page 381).

British Aircraft in China



Westland Wessex three-engined 6-8 seater cabin monoplane fitted with Genet Major 105-110 unsupercharged engines

YET another sign of the increasing interest of British manufacturers in the Far Eastern markets is shown by the fact that a general purpose Westland Wapiti Biplane is at present touring China, designed and built by The Westland Aircraft Works, of Yeovil, Somerset, England.

The Westland Aircraft Works is a branch of the old established and world renowned oil engine manufacturers, Messrs. Petters Limited, who have supplied in the Far East so many installations for electric lighting, pumping, sawing and other work in situations where the necessity for a small local power unit is important.

The Westland Aircraft Works commenced operations during the War, in 1915, and since that date have produced a large number of interesting machines. These include the "Wizard" single seater fighter, a high winged monoplane, the first fighter of its type produced in England; the Westland six-seater, single engined cabin limousine, winner of the £7,500 prize in the Air Ministry competition in 1920, as well as a large range of other aircraft, the most recent being a low wing interceptor fighter monoplane, the "Wessex" three-engined, cabin monoplane, and the "Wapiti" general purpose aircraft.

The Westland "Wapiti" (produced literally in hundreds for the Royal Air Force, the Royal Australian Air Force and manufactured in South Africa for the South African Air Force under licence), is used most extensively in all the Eastern Dependencies and Dominions belonging to Great Britain, such as Iraq, India, Egypt, etc., where in operation it has proved the maker's claim that it is a first-class machine for all general purposes, such as reconnaissance, photography, survey, bombing, army co-operation, advanced training, long-distance patrol and police work.

As mentioned, one of the machines (with Armstrong-Siddeley Jaguar S Engine) is at present being demonstrated in China by the Far Eastern Aviation Co., agents for Westland aircraft products in that country. Before the completion of its tour it will have been shown to all the leading Chinese military aviation authorities who will have an opportunity of estimating the superiority of this machine for police work and military operation under extremely difficult conditions, as for attack in mountainous districts on bandits, for artillery co-operation and bombing, for aerial photography on lines of communication and for map making, both during hostilities and on their cessation.

A machine of an altogether different type is the Westland "Wessex" three-engined, six-seater cabin monoplane for air-line service. In the last few months standard models have been improved by the fitment of three 140 h.p. Genet Super Major Engines, instead of the three 105 h.p. units previously installed, giving the machine a considerably better performance without any loss to its high standard of safety and reliability.

With a ceiling of 7,500 ft. on any two engines, (should one of the engines by any chance fail to operate) and of 16,100 ft. with all three engines (in both cases fully loaded with a payload of 1,100 lb. excluding pilot, fuel and oil, or as a freighter, a payload of 1,200 lb.) this machine fulfills all requirements of civil aviation in China.

Apart from the obvious disadvantages of forced landing in a country liable to the disturbed conditions prevailing in China, the avoidance of mishaps is absolutely necessary to the development of air-mindedness in a people who have not had the opportunity of becoming so to anything like the extent that prevails in countries in the area of the Great War, where the daily use of aircraft has developed to an enormous extent during the last few years. In such countries the lesson that has been learned is the futility of attempting to operate a 100 per cent reliability commercial air service with single engined machines.

In building the "Wessex" the manufacturers have considered the points so essential for the satisfactory operation of civil aircraft. Safety, high payload and low operating costs, a luxuriously appointed cabin, no vibration and a good cruising speed, points of consideration which no manufacturer of modern civil aircraft can afford to ignore, have received the most careful attention of the makers of this machine.

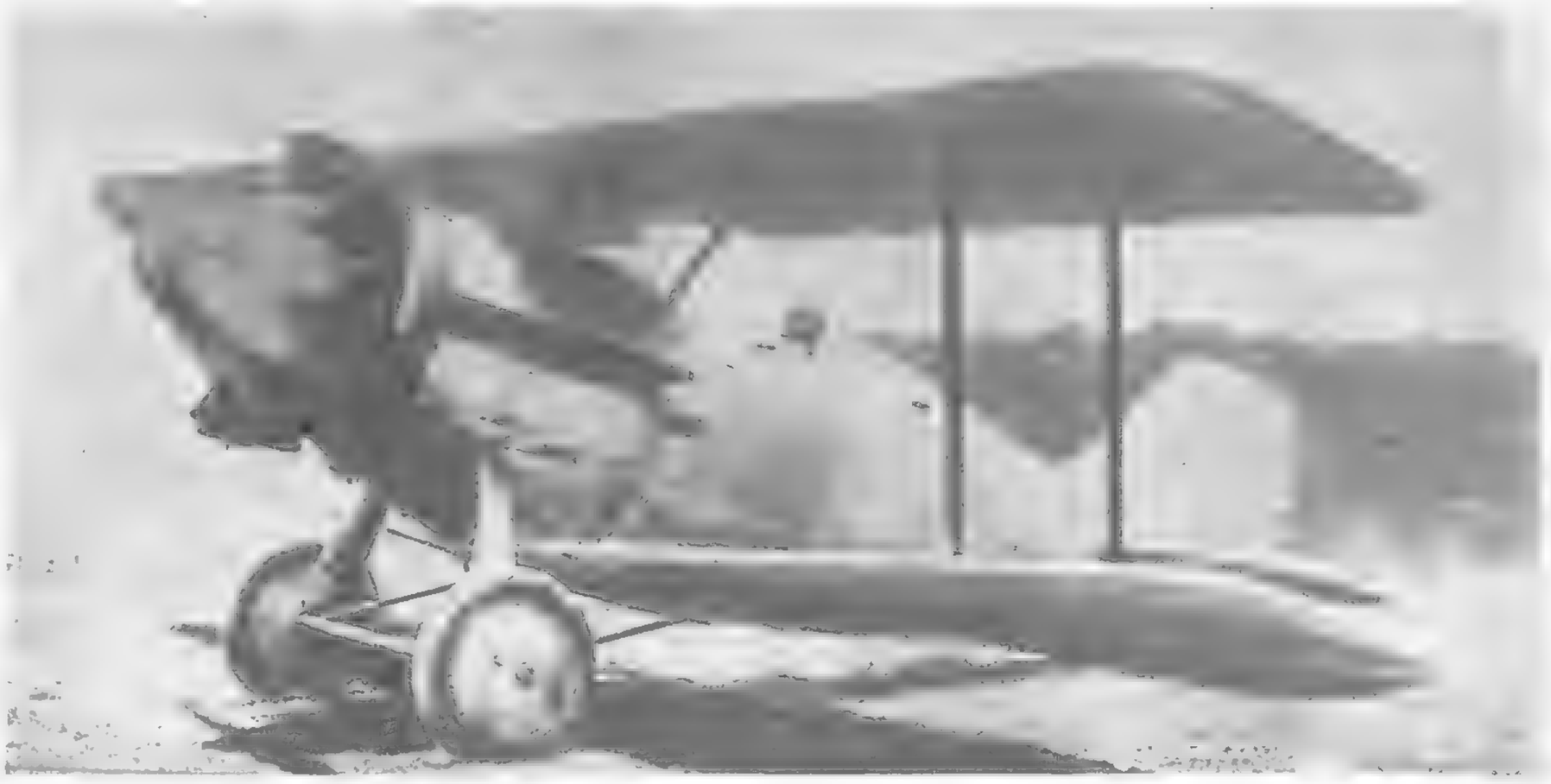
If seven passengers are carried the machine can be run at the very low cost of 1.8 pence per passenger mile, which allows an ample chance of making reasonable profits on an efficiently run air line in a country where railroad travelling is objectionable to many people. Such a figure includes such running costs as depreciation, interest on capital, hangarage, insurance of machine (flying and ground risks, third party and legal liability to passengers) insurance of pilot, cost of pilot, maintenance (ground engineer's wages) annual certificate of airworthiness, engine overhauls and spare parts required for such reconditioning of machine.

A vast amount of business is to be done between such towns as Vladivostok, Dairen, Mukden or Harbin and the great southern cities of China, Canton, Hongkong, Hankow and Shanghai, not to mention Peking and other important centers *en route*, and to-day it is no small undertaking to proceed by the ordinary means of travel—for example from Hongkong or Shanghai to one of the Manchurian cities or Vladivostok. Such considerations render the use of aircraft of increasingly paramount importance; and, as mentioned, for such purposes the "Wessex" is ideal.



The Westland Wapiti with Jaguar Engine. A military two-seater biplane as supplied to the R.A.F., R.A.A.F., etc.

Military Aircraft in China



The Blackburn "Lincock," Single Seater Fighter Aeroplane

OF the many types of military aircraft in China one of the most interesting at the moment is the Blackburn "Lincock." It was the first Single Seater Fighter aeroplane to be sold in China, the Nanking Aviation Authorities having recently purchased two. It is a machine known in France as the "jockey" type, owing to its small size and exceptional manoeuvreability. It is armed with two Vickers air service machine guns synchronized to fire through the propellor. Although the engine, an Armstrong Siddley Lynx Major, is only 260 h.p., the "Lincock" has a top speed of 164 miles per hour and its ceiling is 22,000 feet. The two machines recently sold to Nanking were supplied by Messrs. Arnhold & Co., Ltd., (Agents for the Blackburn Aircraft Company), whose aviation department consists of Captain W. E. F. Jones, D.F.C., C.A.C., Captain F. A. Swoffer, M.B.E., and an ex R.A.F. Engineer, Mr. Tremewan. This firm represents a complete range of British training, military, commercial aircraft manufacturers of De Havilland Aircraft Co., Ltd. (MOTH family) Fairey Aviation Co., Ltd., (single and 2 seater fighting and bombing aircraft) Handley Page, Ltd., (multi-engined military, night bombing, and commercial passenger aircraft) as well as the Blackburn Aviation Co., who produce the "Lincock" as illustrated in this article.

We gave a resumé of Captain Jones' history in a recent issue of this magazine. Captain Swoffer known in British flying circles recently came from England to join Messrs. Arnhold & Co., Ltd., as their test pilot. He is an ex R.A.F. pilot, was in the R.A.F. during the war and afterwards became an instructor at the Royal Air Force Central Flying School. On leaving the service in 1927, he became chief instructor to the Hampshire Aeroplane Club where he remained until 1929. He then flew a Moth to Africa to join a Company which had recently been formed in that country. Later he flew an Avro Five three-engine Monoplane to Tanganyika and South Africa. His wide experience in aviation is a welcome addition to China aviation circles at this important stage.

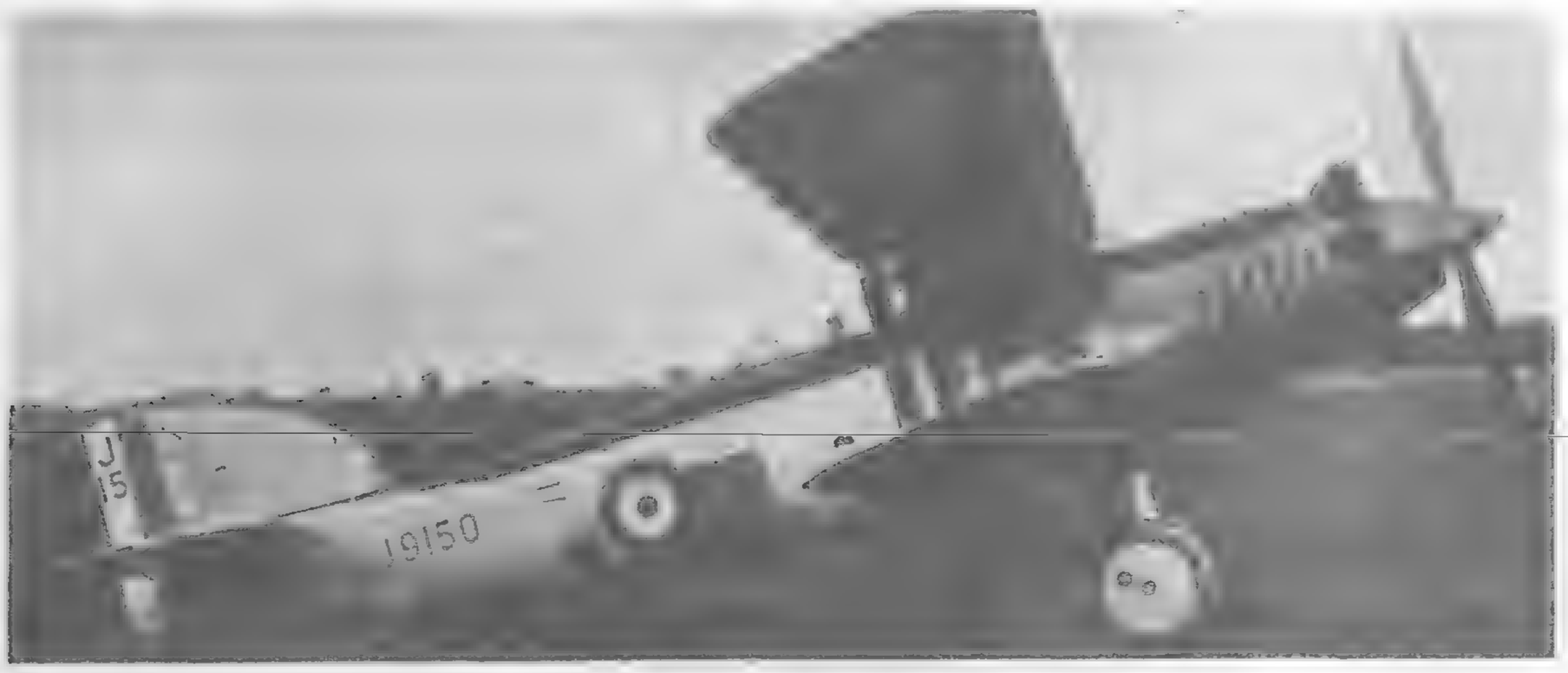
The first Lincock brought to China was at the request of Marshal Chang Hsueh-liang, who intimated he wished to re-equip his air force with a modern fighting machine suitable for his pilots. This machine was erected and demonstrated in Mukden and created a very favorable impression there amongst the Chinese officials and pilots, of whom one flew it a number of times most successfully.

The Nanking "Lincocks" were assembled, tested, demonstrated and machine guns fired at the Hungjao Aerodrome. The machines were then taken over by two Chinese pilots, who, without any previous experience whatsoever on this type of machine, flew them to Nanking.

The now world famous "Gipsy" Moth is used all over the world as a training and pleasure flying aeroplane. It is the same type of machine that Mr. Scott recently flew to and from Australia in record time. A considerable number of these machines have been sold in different parts of China and nineteen were recently purchased by the Mukden Authorities for training purposes. Two are now being assembled at Changsha.

The Fairey Aircraft Company recently supplied twelve of their Fairey 3-F General Purpose machines to Greece, and 45 of their latest type "Firefly" II M. Single Seater Fighter to the Belgian Government. The "Firefly" has a speed of 200 miles per hour and is one of the fastest fighting planes in the world. A Fairey 3-F has been brought to China by Arnhold & Company, Ltd., for demonstration to the Chinese Government and is now on the ground being assembled. This type of machine has many purposes, including day bombing, offensive and defensive fighting, reconnaissance, communications, artillery observations aerial photography and can also be utilized as an aerial ambulance. It carries two guns, one being synchronized to fire through the propellor operated by the pilot, and the other in the observer's seat to protect the machine from enemy fighting aircraft. In addition it can carry wireless equipment or a camera. The demonstration Fairey 3-F now in China is completely equipped for all purposes.

Messrs. Arnhold & Co., Ltd., also represent the Handley Page Aircraft Company, who built night bombing machines in addition to the large 40-seater passenger 'planes recently supplied to the Imperial Airways of England. The present interest shown by the Chinese Government in development of commercial air routes, as well as re-equipment of the aerial fighting squadrons is a matter for much satisfaction and indicates the general progressive spirit evident throughout China.



The Fairey III. F.

BRITISH MILITARY AIRCRAFT IN CHINA



Lincock at Shanghai, May, 1931



Two Chinese Pilots of the Nanking Air Force Taking Delivery of the Lincock Fighting Plane and Leaving for Nanking, May, 1931



Captain F. A. Swoffer, Test Pilot, Seated in Lincock at Shanghai Aerodrome, May 1931



Lincock at Shanghai: Chinese Pilot ready to take off for Nanking. This photo shows Left side Machine gun

Air Conditioning in China

The York System Installed in the King's Theater, Hongkong

AIR conditioning is a branch of engineering that has come into prominence only in recent years although its history dates back 20 to 30 years. During recent years, it has made such rapid progress that modern engineers can design machinery to meet any requirement of temperature, or humidity, while ordinary fans have been relegated to the limbo of forgotten things as far as creating comfortable summer conditions in theaters is concerned. The air conditioning plant recently put into operation at the King's Theater in Hongkong will be able to maintain healthful and comfortable conditions inside the theater regardless of the temperature or humidity outside.

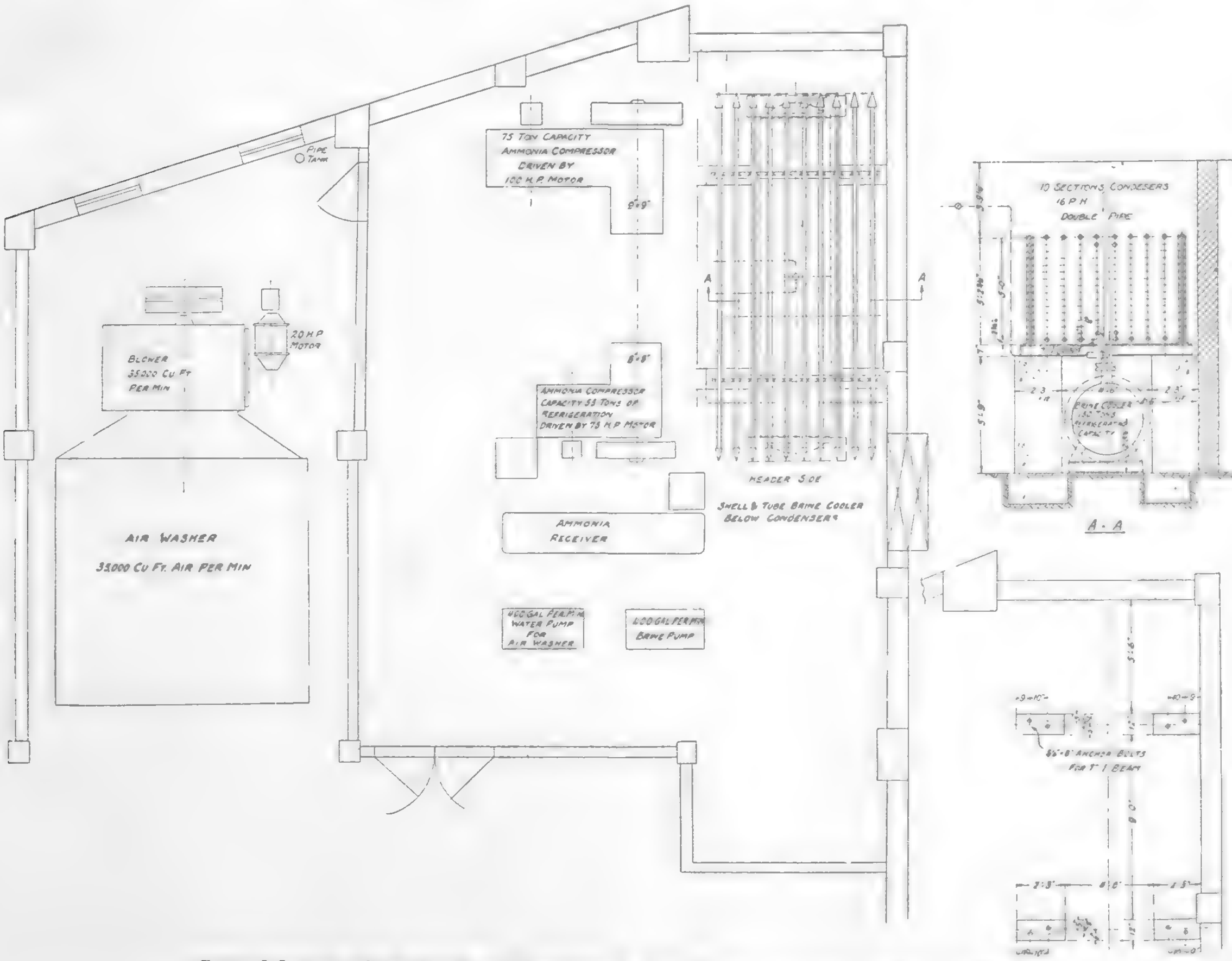
The King's Cinema Theater is the first public building in Hongkong to be equipped with an air conditioning plant using mechanical refrigeration for cooling and dehumidifying air although there are a number of similar installations in Shanghai, such as, the Nanking Theater, the Cathay Hotel ballroom and the ground and first floors of the office spaces of the Wayfoong House.

The plant at the King's Theater, as well as the similar plants in Shanghai, were designed and installed by York Shipley Incorporated of Shanghai. The system used has been developed by the York Ice Machinery Corporation and is very widely used in the cooling and dehumidifying of office buildings, theaters, and department stores in America and Europe.

The technical considerations in designing an air conditioning plant for a theater are particularly intricate inasmuch as the cooling is applied to human beings, and consequently the calculations applying to ordinary cooling do not apply in preparing a comfortable atmosphere for a large number of people. In a cooling system of this kind, the principal consideration is the removal of the heat created by a large number of people in an enclosed space. It may be surprising to many people to learn that an adult person radiates as much heat in one hour as it would require to raise the temperature of 400 lb. of water 1 degree Fah., and by the same basis of calculation, 1,200 people sitting in a theater would radiate sufficient heat to raise the temperature of 480,000 lb. of water 1 degree Fah., or in other words, this would be sufficient heat to melt two tons of ice in one hour.

It is not only necessary to remove this large amount of heat created by the audience, but at the same time, it is necessary to condense the moisture which is delivered to the air in the theater by the respiration of the audience, which would amount to 180 lb. of water vapor per hour for 1,200 people, and the condensation of this amount of water vapor would be sufficient to melt approximately one ton of ice per hour.

There are other considerations, such as, the transmission of outside heat through the walls of the building and the heat



General Layout of the York Air Conditioning Installation for King's Theater, Hongkong

developed by the illumination inside the building, but these are small factors in comparison with the large amount of heat created by the audience.

Experiments conducted by the scientific and technical societies in America and Europe have resulted in certain standard conditions which are considered most desirable in a public space and these in turn are subject to the conditions prevailing outside the building. For theaters a humidity from 55 to 60 degrees is considered desirable inside the theater and this percentage is constant for all atmospheric conditions, but the desirable temperature inside changes with the outside temperature as is illustrated by a very few examples as follows :—

If the outside temperature is 80° Fah., the inside temperature would be most comfortable at 75° ; if the outside temperature is 85°, the inside temperature should be 76° ; if the outside temperature is 90°, the inside temperature should be 77°; if the outside temperature is 95°, the inside should be 80° ; and if the outside temperature is 100°, the inside temperature should be 83°.

The air conditioning plant at the King's Theater might be likened to the human body in its general operation. The machinery in the basement of the building acts somewhat as the heart and lungs of the plant, while the air ducts leading to all parts of the building serve as arteries to carry the fresh air to every part of the building, and the return air ducts picking up the heated air from outlets under each seat act as veins to bring the air back to the purifiers and pumps in the basement.

The air circulation is produced by a Multivane fan of such a size that it requires a 20 h.p. motor to operate it and this fan distributes approximately 35,000 cu. ft. of air every minute to be divided between a large number of inlets to the auditorium. This air is pumped through a large steel room in which cold water is sprayed into the room in a finally divided state, so that every particle of air comes in contact with this finally divided water, and the air is both cooled and washed by passing through this water spray, which is similar to a shower of rain, and the air is both cooled and purified by this process. It seems like a contradiction to say that the air is dehumidified, or dried in passing through this spray of water, but such is the case due to the fact that the water temperature is approximately 38 degrees Fah., and while the air goes away from the washer in a saturated state, it also means that there is very little moisture in the air, because saturated air at 38 degrees Fah. means dry air when the temperature is increased to the auditorium temperature of 77 degrees to 80 degrees Fah.

The cooling of the water takes place in a separate machine where mechanical refrigeration is used first to cool a solution of calcium chloride brine by means of the evaporation of ammonia, and this brine in turn is pumped to the air washer where the spray, noted above, comes in contact with the cold brine surfaces and is cooled and collected in the bottom of the air washer from which point it is circulated again to cool the air. The refrigerating machinery required for this cooling requires 250 h.p. of electrical energy, and the refrigeration produced is equivalent to the melting effect of five tons of ice every hour.

A refrigerating plant of this kind requires the circulation of approximately 400 gallons of water per minute to condense the ammonia used in the mechanical refrigeration, and one of the unusual features of the King's Theater cooling plant was the method of obtaining this large supply of water which cannot be used over again, and which would, therefore, be expensive unless there was an unlimited source of water supply. The contract for supplying this quantity of water was handled by the Jardine Engineering Corporation of Hongkong and it was obtained by securing permission from the City Government to install a pumping station on the harbor and to extend 6-in. water mains, a distance of approximately 2,000 feet, partly under their own property and partly under the public thoroughfares, thus providing an unlimited supply of sea-water for use with the ammonia condensers. This water has no connection with the water used for washing the air which is naturally fresh water which is renewed once a day to keep it fresh for cleansing and cooling the air.

The San-Kyu Electric Railway of Osaka

(*Continued from page 376*).

Owing to the length of the San-Kyu Line and the heavy inclines, all the carriages for through service are equipped with special safety devices. The most notable is that they are provided with the Mitsubishi's A.B.F. multiple unit control equipment, which, it is claimed, is unknown to other electric railways in the Orient. All the bodies of the carriages are made by the Sumitomo works. The type known as K.S. 33 L is used for the motor carriages, and the one casting KS 60 L is used for the trailer carriages which are the first put into service in Japan.

Another thing that is worthy of note is that the carriages are equipped with compartments as well as lavatories and smoking is permitted. All these arrangements have been made in consideration of the fact that the journey is long for an electric railway. Details of the rolling stock are as follows :

Eight 4-wheeled motor carriages with compartments and luggage rooms, accommodation, 76 passengers ; seats, 50 ; size : length, 20,520 milimeters, width, 2,743 milimeters, height, 5,125 milimeters ; four motors of 200 h.p. each ; electric controler.

Twenty-seven 4-wheeled semi-steel motor carriages : accommodation, 120 passengers ; seats, 72 ; size : length, width, and height are same as the preceding type ; the number and capacity of motors as well as the controler are identical with the preceding type.

Seventeen 4-wheeled semi-steel trailer carriages : accommodation, 144 passengers ; seats, 84 ; length and the width are same as the preceding type ; height, 3,885 milimeters.

Eight 4-wheeled bogie motor carriages for local service with luggage room : accommodation, 110 passengers ; seats, 50 ; length, 19,000 milimeters ; width, 2,743 milimeters ; height, 4,102 milimeters ; four 150 h.p. motors each ; compressed air hand operated brake.

Four 4-wheeled bogie uncovered freight motor-cars : length, 17,100 milimeters ; width, 2,500 milimeters ; motors and controller are same as the preceding type.

Eight 4-wheeled bogie uncovered freight trailer cars : length, 7,830 milimeters, width, 2,489 milimeters ; hand operated air brake.

The company employs the three position automatic block signal system. Special equipment in the single tracked district is so arranged that the signal for departure is given only upon approval of the next station and the track between the two stations is kept all clear.

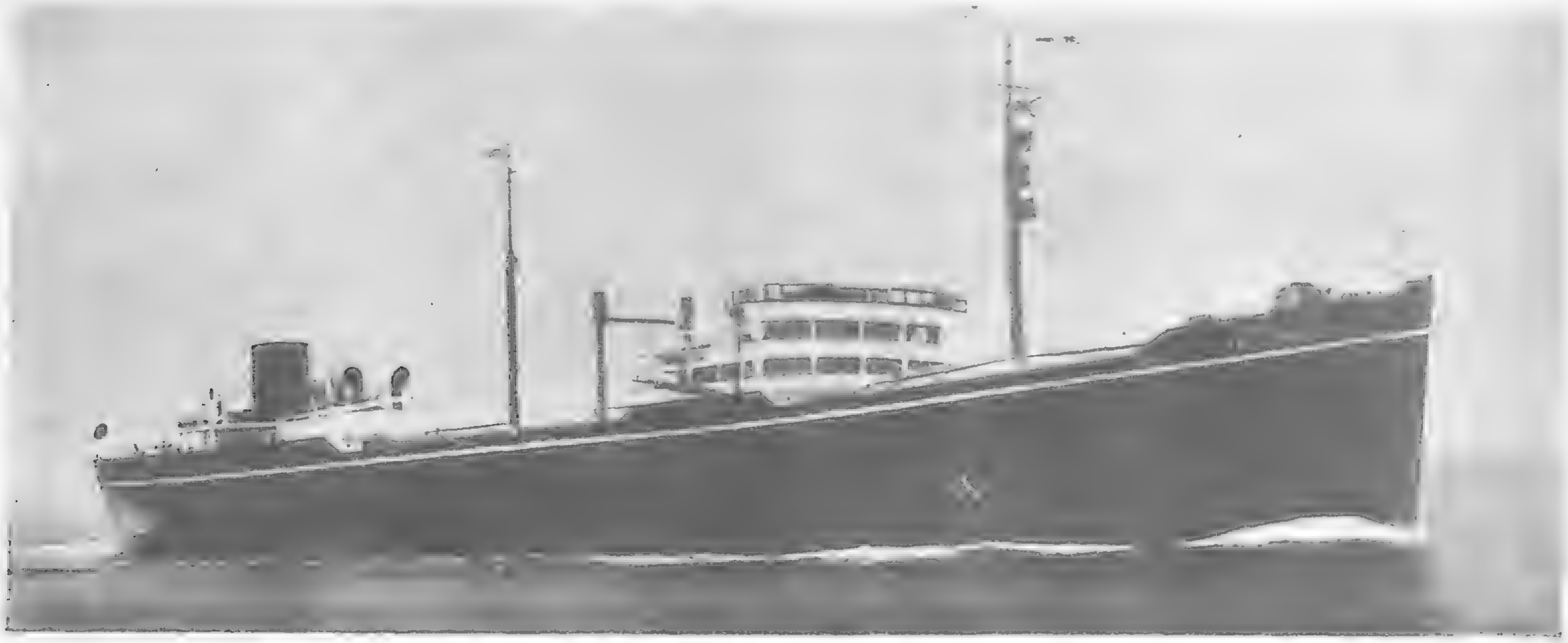
New Kowloon Power Station of the China Light and Power Co., (1918), Ltd.

(*Continued from page 372*).

construction of the line has been carried out by Messrs. Callenders Cable & Construction Co., Ltd., of London and Shanghai with the approval of the China Light & Power Company's Consulting Engineers, Messrs. Preece, Cardew & Rider. Messrs. Callenders who have had world-wide experience of electrical transmission work in all its phases, also supplied the necessary high tension underground cable and the poles for the 6,600 volt lines.

The area to be served represents some 200 square miles, and it is considered that with the security offered under the protection of the British Government and facilities in the way of rapid and cheap transport by road and rail, that advantage will be taken of a supply of electricity being available to establish various manufacturing industries in the New Territories, where land is obtainable from the Hongkong Government at a comparatively low figure.

The number of consumers has approximately doubled during the last five years and now number over 17,000, and when the electrification of the Green Island Cement Works now in progress is complete, an output approximating 30,000,000 B.O.T.U. may be expected.



The 12,300 Ten Motor Tanker "Teiyo Maru"

12,300 Ton Motor Tanker "Teiyo Maru"

Outstanding Twin Screw Motor Ship Built and Engined by Yokohama Dock Co., Ltd., Yokohama, for the Nippon Tanker Co.

THE motor tanker *Teiyo Maru* was recently completed at the Yokohama Dock Co., Ltd., Yokohama, to the order of the Nippon Tanker Co., Ltd., Tokyo, for the Japan-U.S.A. and Japanese coastal service. She is one of a tanker fleet which consists of—

S.S. *Yeiyo Maru*	D.W. 11,600	Speed 14	knots
S.S. *Shoyo Maru*	„ 10,800	„ 12½	„
S.S. *Zuiyo Maru*	„ 10,000	„ 12	„

The new vessel is the largest and highest speed tanker ever built in Japan. The principal particulars of the *Teiyo Maru* are as follows :—

Length, over all	508-ft. 0-in.
Breadth, mld.	64-ft. 0-in.
Depth to upper deck	39-ft. 3-in.
Draft loaded to summer free board..	28-ft. 8-in.
Dead weight	12,300 tons
Gross register	9,850 „
Main engine power	7,200 b.h.p.
Trial speed at light load	17½ knots
„ „ „ full load	16¾ „

The vessel has been provided with accommodations for officers on bridge and flying bridge decks amidships, and those for engineers and other crews in the space under the poop deck.

The vessel has been built in the best present-day practice and style, to comply with the rules and regulations of Lloyd's Register of Shipping, 100 A.1. and L. M. C. for carrying petroleum in bulk, and to pass the Japanese Government Steamship Inspection Laws for the first class.

The various scantlings of plating and longitudinals are increased over those required by Lloyd's rule in order to give additional longitudinal stiffness.

It will be seen from the plans that the main cargo oil space is divided into nine compartments, each being further sub-divided by a central longitudinal oil tight bulkhead; machinery space abaft; and fuel oil tanks before and abaft the cargo and machinery spaces as per plan.

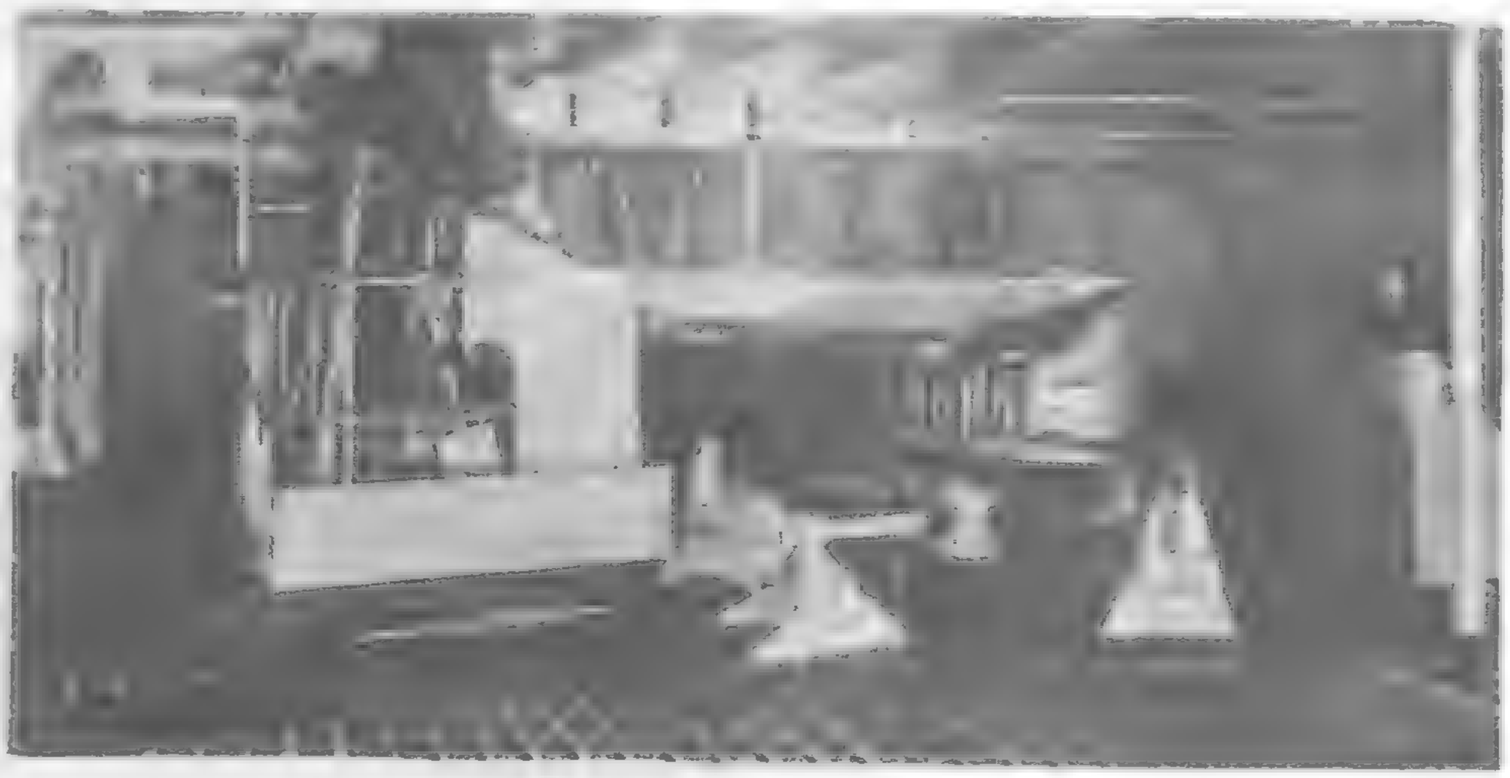
The vessel has been completed with dead-weight capacity of 12,300 tons on loaded draft to summer freeboard, and has been proved to maintain a service speed of even 15 knots or more by several trial trips.

It is most noticeable that no vibration was anywhere felt during overloaded trials, owing to perfect engine balancing, strength uniformity, special arrangement, etc.

The oil pumping arrangement is powerful, there being four 300 ton cargo oil pumps built by the Yokohama Dock Co., each having a 12-in. suction bore and 10-in. delivery.

Machinery

The main propelling machinery, constructed by the Yokohama Dock Co., Ltd., the Japanese licenced manunufacturer of the M.A.N, engines, consists of two sets of "Yokohama M.A.N." Diesel engines of double acting, two stroke, airless injection type, each engine having six working cylinders of 600 mm. diameter, with a piston stroke of 900 mm., and developing 3,600 bhp. at a speed of 125 r.p.m. This engine is the same type and size as those which have been to the supplied by the builder motor cargo



The Steam Steering Gear

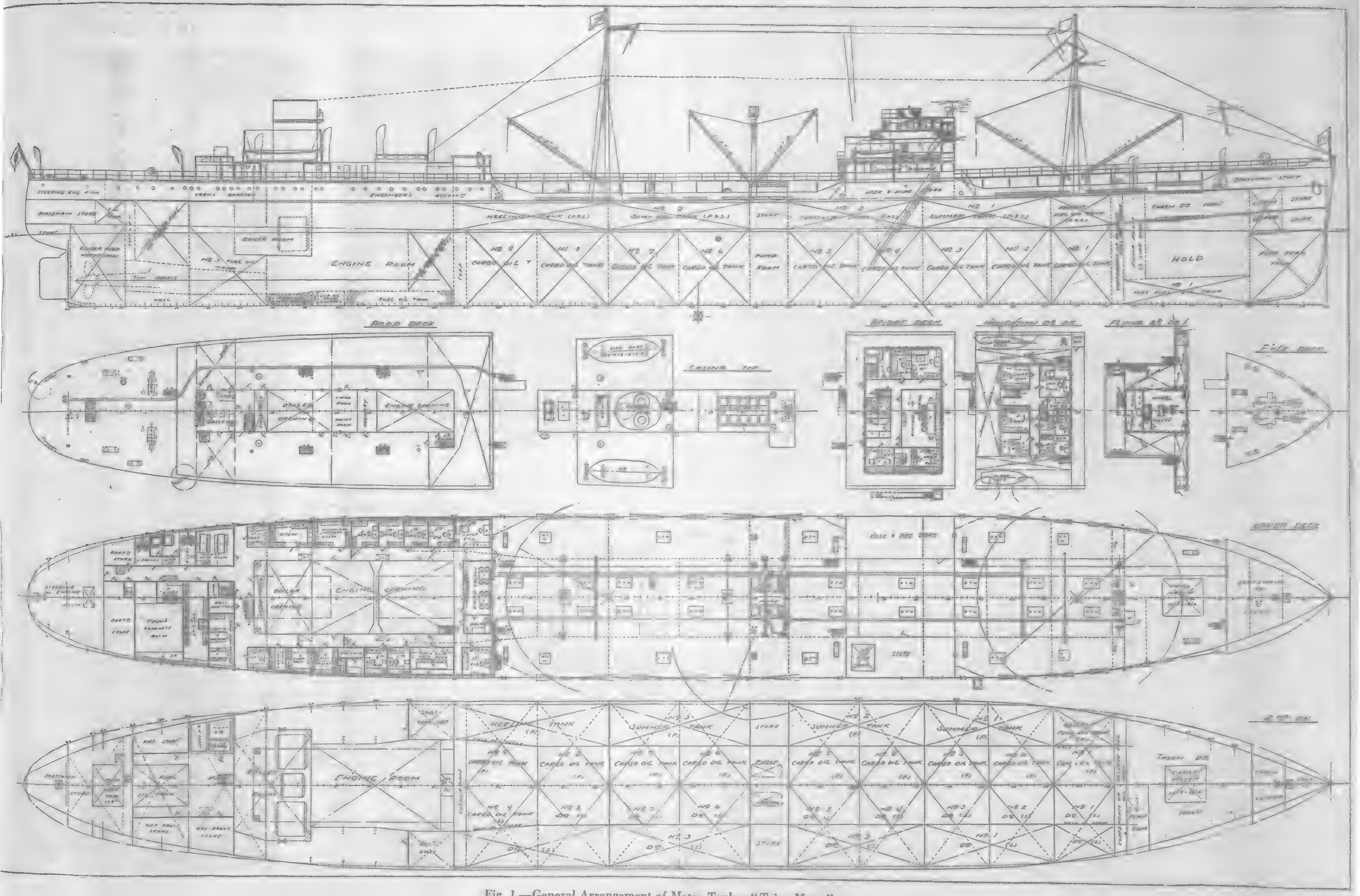
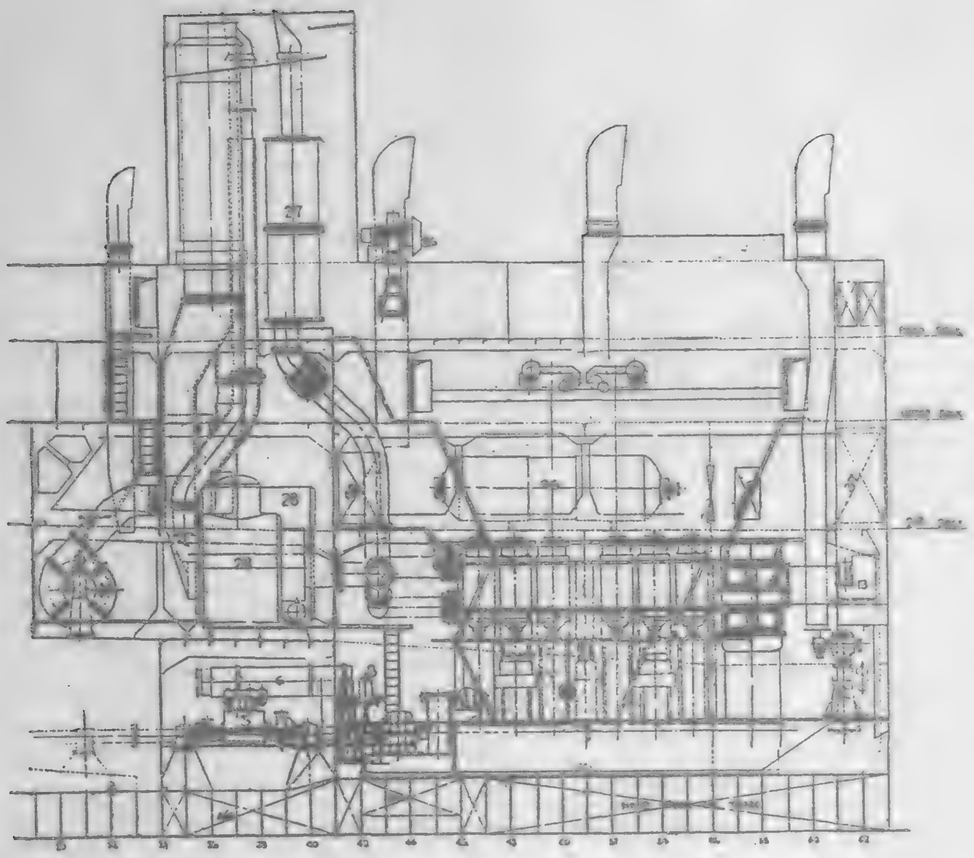
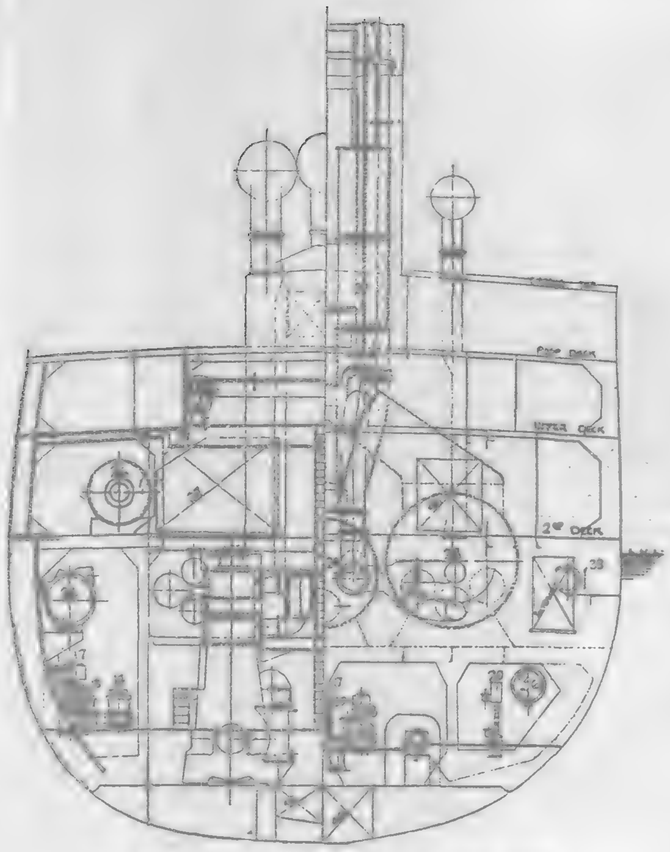


Fig. 1.—General Arrangement of Motor Tanker "Teiyo Maru"





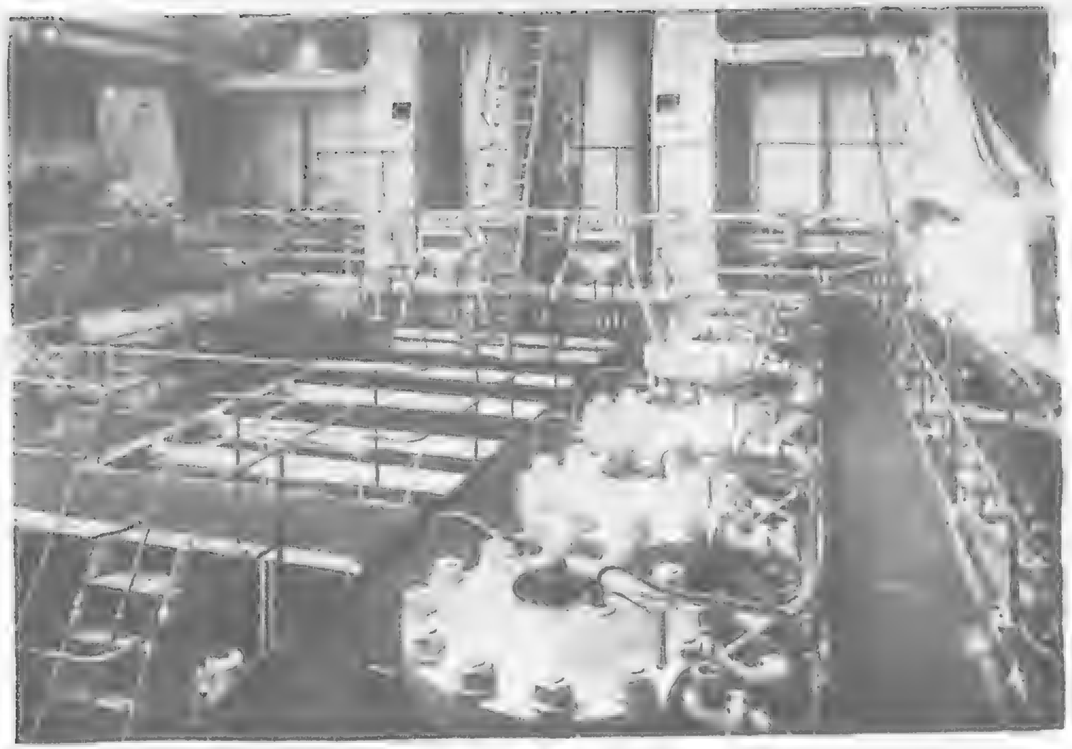
日本タンカー株式會社

機關室全体裝置

M.S. TEIYO MARU
NIPPON TANKER K.K.
GENERAL ARRANGEMENT
OF
ENGINE ROOM



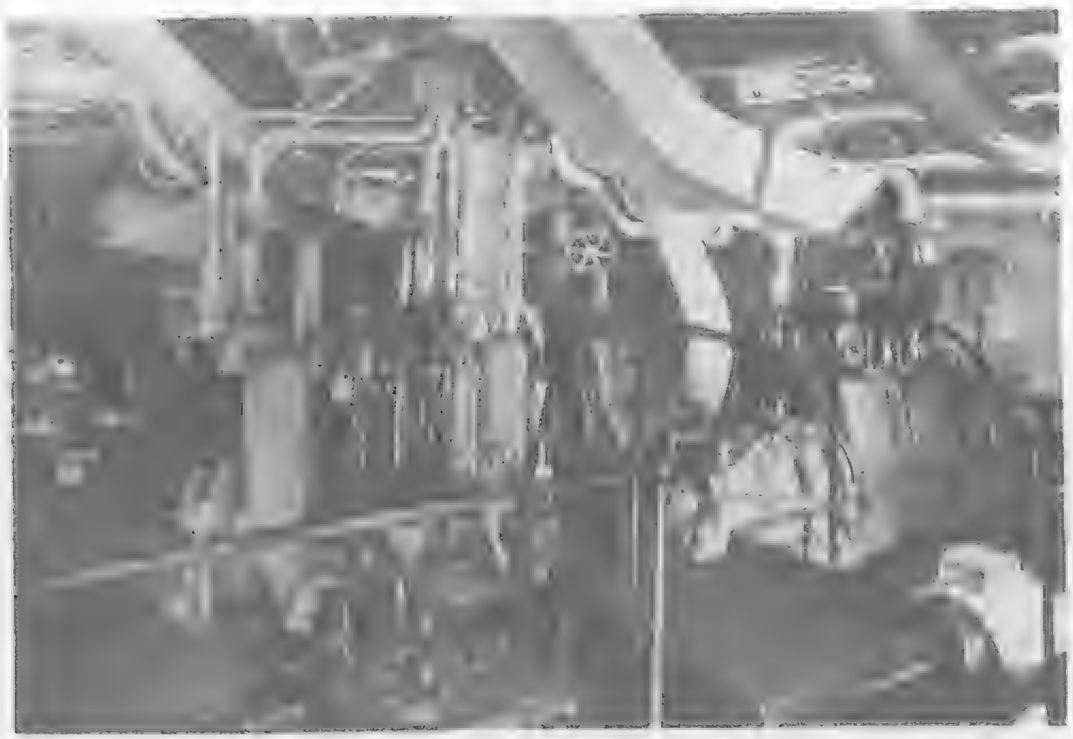
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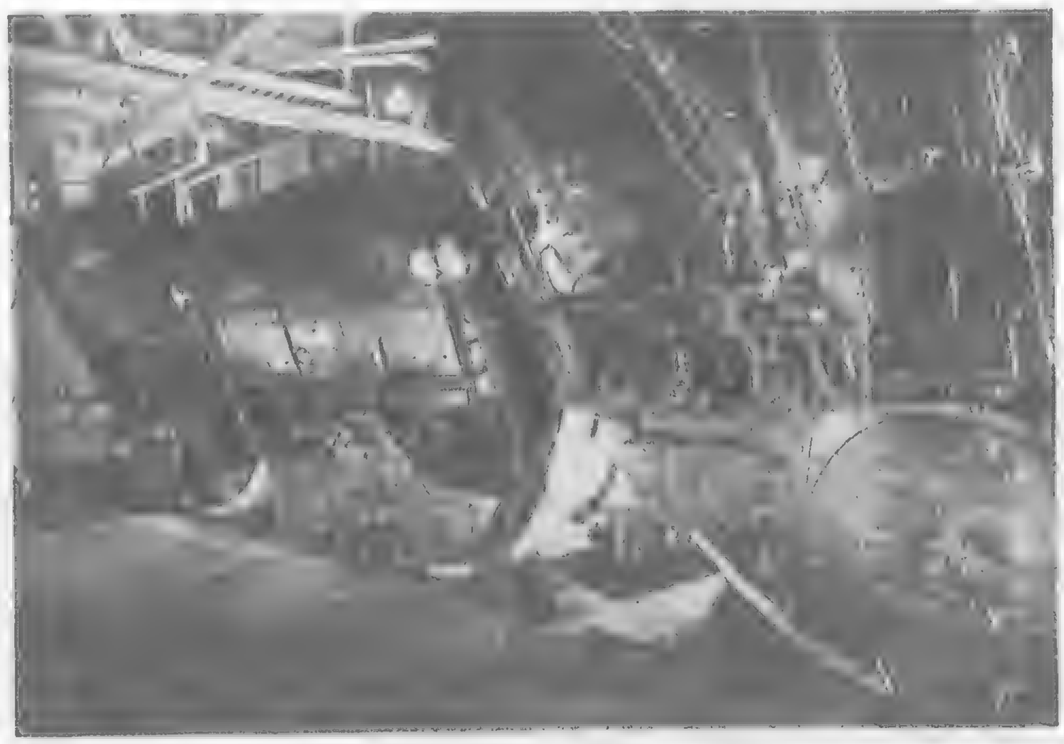
Upper Part of Main Engines



View of the Port Side Showing the "Turbulo" Oily Water Separator and General Service Pumps



View of Thrust Recess. Showing Cooling Water Pumps and Lubricating Oil Pumps

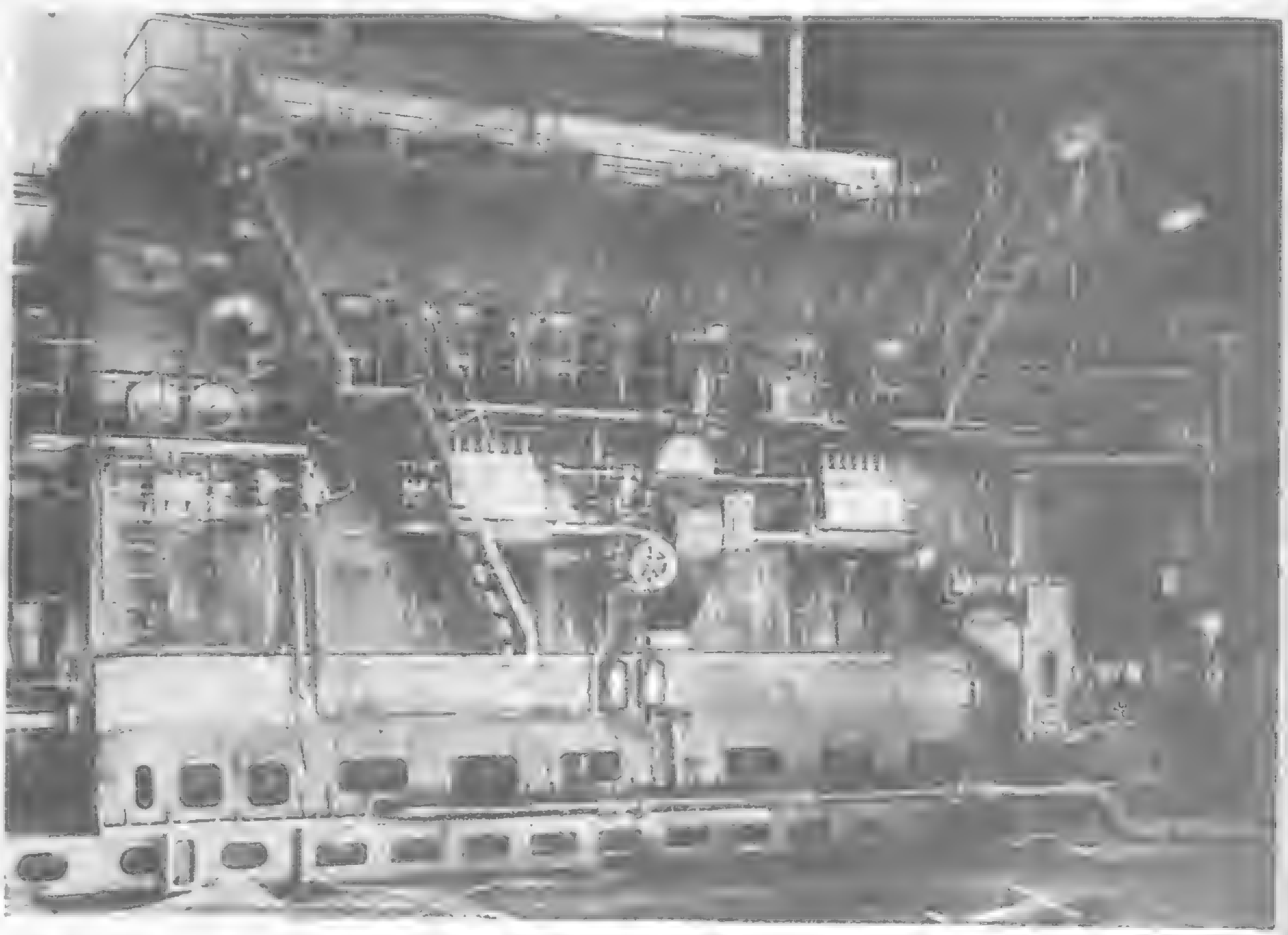


Boiler Room, Exhaust Boiler at Center

ships *Kwanto Maru* and *Kwansa Maru*; but in this case, the scavenging pump is directly fitted to the main engines instead of turbo-blowers driven by separate motors as in the previous ships. The scavenging pump of the *Teiyo Maru* has two pistons arranged in tandem, and patent Hoerbiger valves and is driven by a crank at the forward end of each engine.

All auxiliary machinery in the engine room as well as on deck is driven by steam except the engine room ventilating fan, which is driven by electric motor. As this tanker has a large pumping plant with a capacity of about 1,200 tons oil per hour, consisting of four simplex steam pumps, comparatively large steam boilers are installed for power supply.

Three boilers in all are arranged in the boiler room situated at the top the after engine room. Two boilers are of ordinary marine cylindrical type, each having a diameter of 13 feet, with a length of 11 feet 6 inches, designed for 180 lb. gauge working pressure under forced draft. Each boiler is fitted with three patented "Yokohama White" oil burning furnaces, and with Yokohama Dock Patent plate type air preheater. It is worth mentioning that about twice as much heat as ordinary tube type preheater is absorbed from funnel gas, and the air temperature was raised up to 150°C. (302°F.) during the trials.



One of two 3,600 b.h.p. Yokohama M.A.N. Two cycle double acting airless injection engines in Diesel engine testing shop of Yokohama Dock Co., Ltd.

The exhaust boiler is of "Yokohama" patent combined water tube type; one furnace at center being arranged for oil burning, while two tube nests at both sides are for Diesel engine exhaust. The Diesel engine exhaust gas passes from back of boiler to front and then to funnel. Thus, only the exhaust boiler is used while the ship is running, to supply necessary steam to all auxiliary machinery. In this way two to three tons of fuel oil can be saved per day. The exhaust boiler has a diameter of 9 feet 6 inches, length 8 feet 1½ inches, and is designed for a working pressure of 120 lb. gauge. In the boiler room the following auxiliary machinery is installed:

One Yokohama White oil burning duplex unit,
One forced draft fan engine,
One oil transfer pump,
One feed heater,
One feed filter tank.
All of the above were made by the builders.

All the principal auxiliary machinery is arranged at thrust recess, aft of engine room floor. There are two sets of combined centrifugal fresh water and sea water cooling pumps, each driven by a compound steam engine, one set for standby. Three sets of lubricating oil pumps of vertical simplex type, two for working and one for standby, are also fitted in the thrust recess. There are also in the engine room, two fresh water recoolers; two lubricating oil coolers and filters; two sets of fuel oil transfer pumps, of 40 tons/hour capacity each; one vertical duplex bilge pump; one sanitary pump of same type; one condenser cooling pump; one general service pump; two feed pumps; one air pump; one condenser; one evaporator; two sets of dynamo engines of 25 kw. capacity. All the above auxiliary engines and pumps are made by the builder. Besides the above auxiliaries there are one starting air compressor made by Reavel & Co., England, one DeLaval lubricating oil purifier; one oily water separator and one fine filter for fuel oil both of "Turbulo" type.

Deck machinery consisting of one windlass, one steering gear of direct acting quadrant type, two 7-ton mooring winches, two 4-ton and one 2-ton cargo winches, are also steam driven and built by the Yokohama Dock Co.

Trial Trips

On April 20 and 24, sea trials are carried out with successful results as follows:—

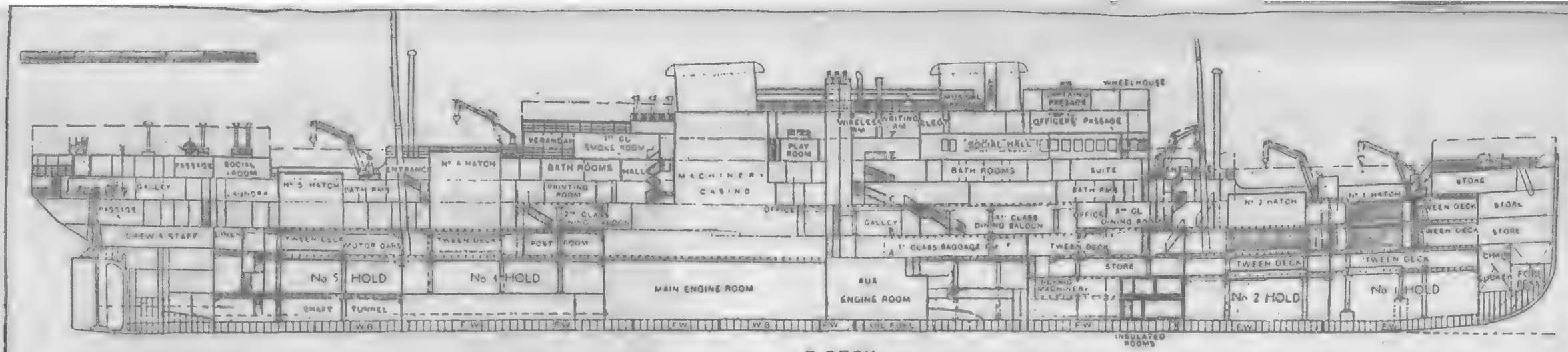
	Light load Trial	*Full load Trial*
Draft, mean	14-ft. 1.375-in.	26-ft. 7.25-in.
Dispt., corresponding	8,480 tons	18,797 tons
Speed in knots	17.53	16.74
B.H.P., main engine	7,827	8,624
R.P.M., „ „	140	135

Two 15-knot Japanese Cargo Liners

As a result of the success of the six 15-knot cargo liners built for the Osaka Shosen Kaisha's service between Yokohama, Los Angeles and New York, two more similar vessels have just been ordered, for completion in the early summer of 1932, so that the service may be maintained fortnightly instead of on an 18-day basis as at present. The vessels are 445-ft. b.p., with a beam of 60-ft. 6-ins. and a draught of 27-ft. 11-ins., and a deadweight capacity of 9,900 tons. The machinery power is 7,200 b.h.p., giving a trial trip speed of 18 knots and a regular service speed of over 15 knots.

The order has been placed with the Mitsubishi Nagasaki Dockyard and the engines will be of the Mitsubishi-Sulzer type.

Coal in China.—The Chai Tong coal mines at Hopei, near Peiping, China, yield both coking, bituminous and anthracite coal. A large sum of money was spent by the last operating company on a 20 mile railway, connecting the mines with the Peiping-Hankow Railway, but a further big expenditure will be required to put the line into good working order. It is considered that these mines will hold an important place in North China, due to their proximity to Peiping, Tientsin and the Tangku sea ports.



PLANS OF THE MESSAGERIES MARITIMES LINER "FELIX ROUSSEL."

The New Messageries Maritimes Motor Liner "Felix Roussel"



The "Felix Roussel" in Shanghai on her maiden trip

THE new 21,000 tons French motor passenger liner *Felix Roussel*, which has just completed its maiden trip to the Far East, is the third motorship built for the Société des Services Contractuels des Messageries Maritimes by the Ateliers et Chantiers de la Loire at Saint Nazaire and it is the first motorship put into the Far Eastern service of the line.

The *Felix Roussel*, named after the late Chairman of the Messageries Maritimes, is the largest of the three new motorships of the line and is the second largest French motorship afloat. Of four additional motor vessels under construction for the Messageries Maritimes, two will be placed in the Japan-China service while two are for the East Africa line.

The *Felix Roussel* was built under survey of the Bureau Veritas. The principal particulars of the ship are as follows :

Length overall	559 ft.
,, between perpendiculars ..	545 ft.
Breadth	68 ft.
Depth	46 ft.
Deadweight capacity	7,200 tons
Total space of holds and 'tween decks	12,284 cubic meters (11,200 T. of 40 c.f.)
Displacement	20,945 tons]
Speed	16 knots
Horse power	11,000

General Arrangements

The motor ship has been built in accordance with the stipulations of the highest class of the Bureau Veritas.

She carries 24 life-boats including two motor-launches fitted with wireless apparatus.

Her outward appearance differs somewhat from that of the other of the Company's motorships. Her two funnels are short and rectangular, of a very modern line.

Main and Auxiliary Machinery

The main engines are two Diesel-Sulzer single-acting two-cycle engines each acting one screw. The total output is 11,000 s.h.p. at 110 r.p.m.

The auxiliary machinery includes :

2 turbo-blowers for the supply of scavenging air.
2 sets of lubricating-oil motor pumps.
2 sets of cooling-water motor pumps.
2 sets of 325 k.w. generators driven by 525 h.p. four-cycle Diesel-Sulzer engines.
3 sets of 325 k.w. generators driven by 475 h.p. engines. (The current is supplied at 220 volts).
3 electrically driven air compressors.

Commercial Particulars

The five holds have a capacity of :

		tons measurement.
No.	I	600
No.	II	1,050
No.	III	2,240
No.	IV	2,240
No.	V	1,110

The ship has seven 'tween-decks with a total space of 5,500 tons measurement. Besides a certain number of store rooms for small packages, parcels, mail, baggage, etc., a special store-room has been provided for silk goods and other valuable cargo. Capacity: 860 cubic meters (750 tons m.) It has a strong-room lock making robbery absolutely impossible.

(Continued on page 396)



Grand Staircase Leading To First Class Dining Saloon



One of the Spacious First Class Cabins

LUXURIOUS ACCOMMODATIONS ON THE NEW M.M. MOTOR LINER, "FELIX ROUSSEL"



Lounge Entrance, 1st Class



Drawing Room, 1st Class



Smoking Room, 1st Class



Dining Room, 2nd Class



Old Caisson before demolition works commenced

Hongkong and Whampoa Dock Company Completes Huge Project

Main Dry Dock is Enlarged so that it can Accommodate the Largest Pacific Steamers

In February, 1929, the Directors of The Hongkong and Whampoa Dock Co., Ltd., decided that their existing No. 1 Dock at Kowloon should be enlarged so as to be capable of docking any ship at present on the Pacific Ocean trade.

This dock was originally built in 1883 and to dimensions which at that time were considered ample for many years to come. As constructed then the length of the dock was 600 feet from caisson to head of dock and the other dimensions were :—

SILL

Width at cope	86-ft. 0-in.
Width at floor	70-ft. 0-in.
Depth of water over sill	29-ft. 6-in.

INSIDE DOCK

Width at cope ..	126-ft. 5-in.
Width at floor ..	66-ft. 2-in.

Subsequently, in 1910, the dock was extended 100 feet at the head thus making the total length 700 feet.

Plans for the widening of the entrance were prepared by Messrs. Leigh & Orange, Civil Engineers, Hongkong, under whose instructions the work was subsequently carried out. In April, 1929, the contract for the work was let to Messrs. Lam Woo & Co., Hongkong.

The revised dimensions decided upon were :—

SILL

Breadth at cope ..	93-ft. 10-in.
Breadth at floor ..	88-ft. 0-in.
Depth of water over sill	30-ft. 6-in.

Inside the dock the sides were to be cut away so as to give a width of 88 feet at floor level.

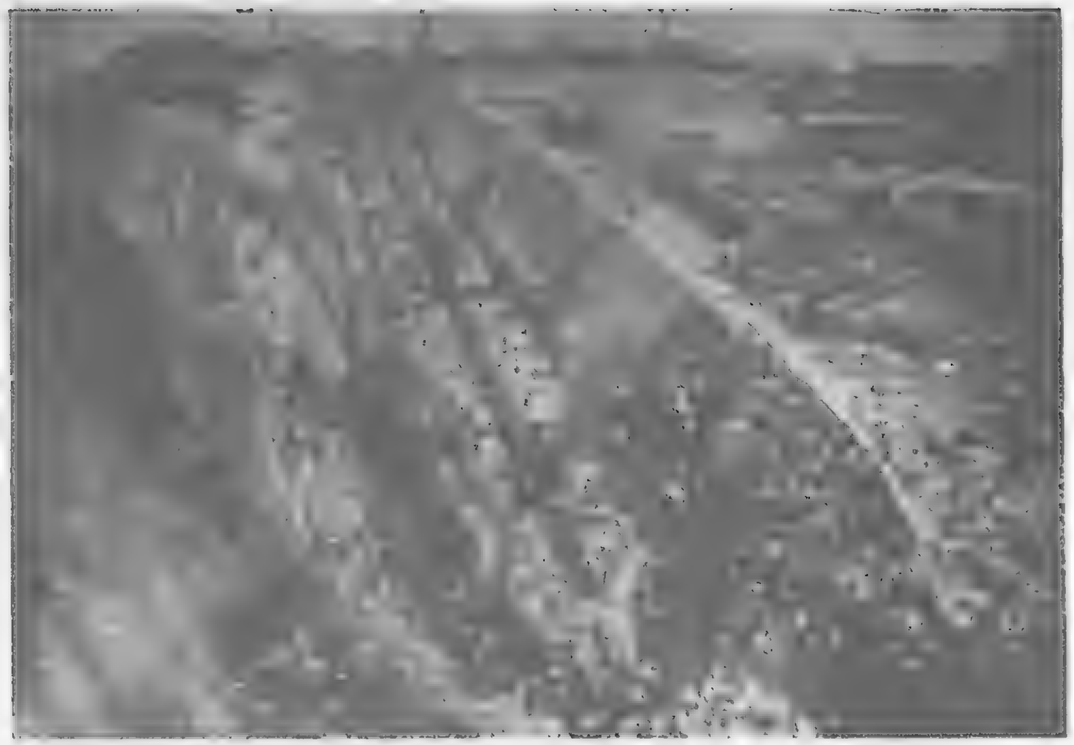
The new sill was constructed 50 feet inside the existing sill and the dock was lengthened by a similar amount by cutting away at the head so as to maintain the length of 700 feet.

The Dock Company, required that the dock should be available for docking ships during the currency of the contract, so far as this could be arranged with safety, in order that their business could be carried on. Work was commenced inside the dock for widening the floor in June, 1929, and for the new entrance in August, and the work was sufficiently completed to enable the *Empress of Japan* to be docked on January 15, 1931.

During the period from commencement of work until the *Empress of Japan* was docked, the dock was actually occupied by various ships for docking purposes on 321 days. The work entailed the construction of a new caisson, cill and wing walls for the new entrance behind the existing walls and sills and which latter were



View before removal of old Caisson



View during construction showing sides partially completed



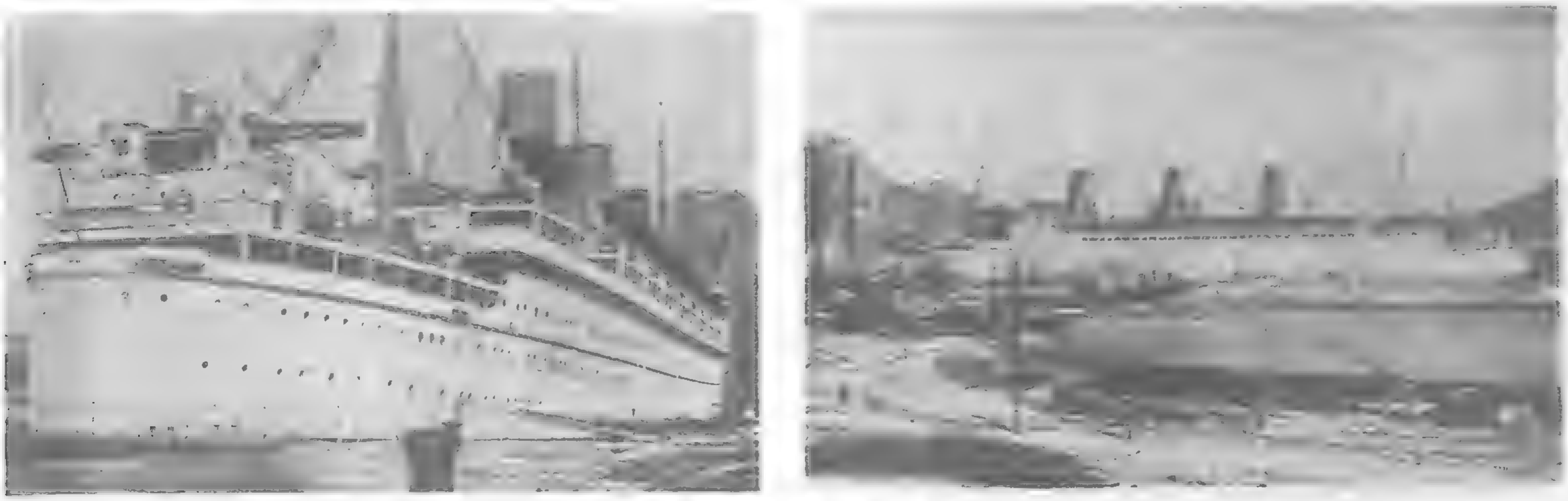
Looking up dock from sill showing sides partially completed



New Sill with New Caisson in position



Side of Dock Completed



Views of Empress of Japan in Dock

afterwards demolished. The wing walls were constructed in coffer dams built of universal joist steel sheet piling supplied by the British Steel Piling Co., London, and driven, and on completion drawn by a Mackiernan - Tierny steam hammer. The old caisson was kept in position in the old outer stop and in conjunction with the coffer dams enabled the heavy construction work to be carried out in the dry.

The wing walls were constructed first and then the new cill formed in front of the old caisson. On completion of the new cill and the junction of the new entrance and wing walls being made the old caisson was removed and the new caisson was placed in position on August 21, 1930. The caisson was built ship type of steel by the Hongkong and Whampoa Dock Co., and fitted perfectly into position and no adjustments whatever to the granite stop or the wooden stem had to be made after the initial placing.

Demolishing and removal of the existing entrance and wing walls was then provided with by blasting above and below water and the material was removed by grabs. Timber jetties were subsequently erected on both sides of the entrance to facilitate docking.

It is noteworthy that the big project of enlarging the Kowloon Dock was carried



"Empress of Japan" in Dock



Construction of New Sill and stop

through to completion in a year that will go down in history as most disastrous for shipping in general and at a time when silver values were at lowest ebb. As set forth in the address of Mr. J. P. Warren, in the chair at the annual meeting of the Company on March 30 last, the cost of the work done on No. 1 dock ran to the figure of $650,000 and this outlay was coupled with extraordinary expense incurred in connection with sterling purchases of materials.

The speaker emphasized that through the year under review shipping laid up all over the world, including many new vessels, aggregated 5,400,000 tons, and the effect of this general depression furnished a reason why the Hongkong and Whampoa Dock Company's gross profit for the year was $170,000 less than the figure for the preceding year. Mr. Warren added that although he could not see at the moment any signs of immediate improvement in general shipping conditions he felt that with the normal advance of shipping activities in China, the Company would benefit ultimately because of its fortunate geographical position.

In the course of the year while the work of enlarging Dock No. 1 was in progress the Company built a number of small vessels mostly motor driven.



Demolition Work in Progress—Showing Coffer Dams



View during construction work for New Sill



New Caisson in Position and Showing Demolition Work in Progress



Looking towards New Sill showing preliminary work for construction of same



Another view of Liner in Dock

A Philippine Motor-car Ferry

175-ft. 1,500 h.p. Chinese-built Ship

THE *Kanlaon* is a twin-screw motor ferry built by the Hongkong and Whampoa Dock Co., Ltd., at their Kowloon Docks, Hongkong. Designed for service between Iloilo and Pulupandan in the Philippine Islands, she will have a speed of 15½ knots on service.

The principal particulars of the *Kanlaon* are :

Length, between perpendiculars ..	175-ft.
Breadth, moulded	30-ft.
Depth, moulded	12-ft. 3-in.
Gross register	400 tons

The vessel is built to Lloyd's 100 A1 class for coasting services in the Philippine Islands and under Lloyd's Special Survey and the Bureau of Customs of the Government of the Philippine Islands.



The "Kanlaon"

There is one complete teak deck, a topgallant forecastle, and a shade deck aft with a navigating bridge and boat deck over. The hull is subdivided into five watertight compartments yielding, in addition to the fore and after peaks, one hold forward and one aft of the machinery space. The forward hatch is served with two electric winches. Space for motor-cars is provided on the main deck in the forward well. The windlass is electrically operated and hand steering gear is arranged on the navigating bridge. An Oertz streamline rudder is fitted.

The accommodation for 350 first-class passengers is provided on the shade deck, the fore end being enclosed and fitted with Beclawat windows. The dining saloon is also arranged on this deck and portable deck chairs are provided. The holds will be used for heavy luggage and racks have been fitted on the shade deck for hand luggage. On the upper deck teak seats are arranged for 350 third-class passengers.

The propelling machinery, constructed by the Aktiebolaget Atlas Diesel of Stockholm, Sweden, and installed by The Hongkong and Whampoa Dock Co., Ltd., consists of two sets of Atles six-cylinder direct reversible, two-cycle airless-injection full diesel marine engines. The designed power of each set is 750 b.h.p. at 220 revolutions per minute. All deck and engine-room auxiliaries are electrically driven, current at 230 volts being provided by one "Skandia" single cylinder crude oil engine coupled to a 5 k.w. Dynamo.

Shipbuilding in Japan

Vessels under construction of over 100 gross tons as at the end of March are as follows :—

Shipbuilding Yards :	*Under Construction* *Number*	*Tonnage*
Yokohama Dock Co.	1	9,000
Uraga Dock Co.	1	5,950
Namura Shipbuilding Yard	1	820
Kawasaki Shipbuilding Yard	1	5,950
Harima Shipbuilding Yard	1	9,300
Mitsui Shipbuilding Yard, Tama	4	15,300
Uwajima Shipbuilding Association	1	140
Mitsubishi Shipbuilding Yard, Nagasaki ..	4	13,410
Total	14	59,870

(Steamer one 820 tons; m-s 12, 58,910 tons; sailing ship, one, 140 tons.)

Shipbuilding Yards :	*Launched* *Number*	*Tonnage*
Ishikawajima Shipbuilding Yard	1	128
Mitsui Shipbuilding Yard, Tama	1	4,350
Uwajima Shipbuilding Association	1	140
Mitsubishi Shipbuilding Yard, Nagasaki ..	1	3,200
Total	4	7,818

Shipbuilding Yards :	*Completed* *Number*	*Tonnage*
Ishikawajima Shipbuilding Yard	1	128
Kanesashi Shipbuilding Yard	1	131
Fujinagata Shipbuilding Yard	1	142
Namura Shipbuilding Yard	1	123
Mitsui Shipbuilding Yard, Tama	1	7,255
Sumitomo Besshi Mining Co...	1	199
Omuta Shipbuilding Yard	1	176
Total	7	8,154

Fuel Research in Japan.—A conference, organized by the Fuel Society of Japan, was recently held in Tokyo, when among the papers read was one on "The Effect of Heating Rate on the Properties of Coke," by Mr. T. Shimmura, of the Japanese Imperial Research Institute; one of "The Combustibility of Pulverized Coal from the Point of View of its Utilization in Coal Dust Engines," by Mr. T. Suwa, of the Research Institute; and one on "A General Review of the Town Gas Industry in Japan," by Mr. Watanabe, the chemical engineer of the Tokyo Gas Co. In connection with the conference a fuel exhibition was organized in Tokyo, and attracted considerable attention, there being over 500 exhibitors. The purpose of the display was "to educate the Japanese public in matters appertaining to fuel and to aid in the improvement of fuel technology and the appliances concerned.



Steamers "Empress of Canada" and "Empress of Australia" at No. 5 Pier of the Hongkong and Kowloon Wharf and Godown Company

Hongkong and Kowloon Wharf and Godown Company Makes Notable Record

WHAT perhaps is a world record in low cost of handling cargo was achieved last year at Hongkong by the Hongkong and Kowloon Wharf and Godown Company. This was disclosed at the company's forty-fourth annual meeting last March when the Chairman, Mr. J. J. Paterson, reported that in the course of the year under review more than 942,000 tons of cargo had been handled at an average cost of $1.13 per ton.

"This figure," Mr. Paterson added, "was equivalent to something less than one shilling and six pence and for cheapness in handling costs, I can safely say, cannot be challenged by any other port."

The speaker added that the Directors of the Company had considered the question of increasing landing charges, but in view of the depressed state of shipping and recent levying of additional costs on shipping using the port of Hongkong, the idea was deemed inadvisable.

In the course of the year a total of 902 steamers discharged cargo at the wharves of the Hongkong and Kowloon Wharf and Godown Company, an increase of 35 vessels over the preceding year.

The Company's work may be divided into three headings :—

1. Landing, shipping and transhipping cargo at the wharves.—The Company owns a water frontage 2,000 feet in length at Kowloon, at which four wharves, each with two berths for Ocean going steamers, are built at right angles to the premises, capable of berthing steamers up to 663 feet in length with a draught of 32 feet at lowest spring tides. A fifth wharf is under construction, adjacent to the Naval Camber at Kowloon, 800 feet long by 60 feet wide built on reinforced concrete columns five feet square.
2. Landing, shipping and transhipping cargo in the stream.—The Company maintains a fleet of 11 (eleven steam and motor tugs and launches and 113 lighters varying in capacity from 75 tons to 200 tons each for discharging and loading cargo to vessels in the stream.
3. Warehousing cargo.—Warehouse capacity 350,000 measurement tons.

The whole of the Company's premises, wharves and godowns are linked up by light railways enabling cargo to be handled on trucks, thus minimizing the risk of damage from careless handling by coolies.

Heavier tracks are laid from end to end of the water frontage for a large number of locomotive cranes capable of lifting up to 25 tons at 30 feet radius, 15 tons at 25 feet radius, 10 tons at 40 feet radius and 2 tons at 60 feet radius.

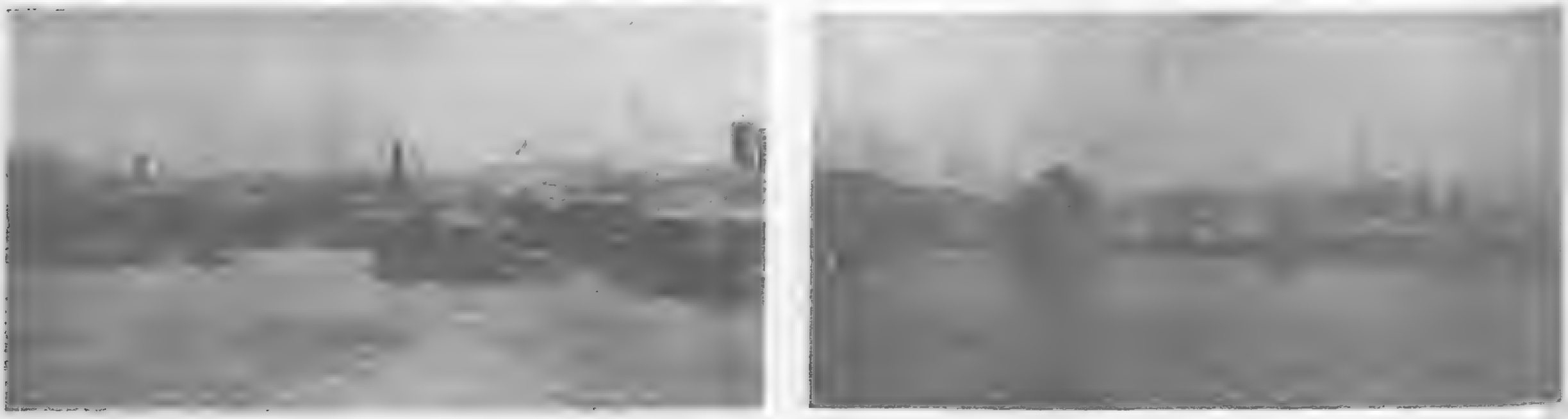
The Company's premises are also linked up with the Kowloon Canton Railway, a siding having been constructed leading right into the yard.

Fresh water pipes are laid on each wharf for the convenience of vessels.

In the newer godowns, which are constructed of reinforced concrete and are fire proof, all the latest equipment for handling cargo, such as electric stacker, electric cranes and like equipment are installed thus ensuring safer and speedier handling of cargo, and an electric conveyor is also installed for transferring cargo to storage godowns.

The area around the wharves and the approaches to the wharves was recently dredged so that there is now a depth of at least 32 feet at lowest spring tides at the berths.

Throughout the premises every precaution is taken against fire ; a system of fire hydrants is placed at intervals all over the Company's premises, connected with the Government mains, and a system of fire alarms is connected direct with the Government Fire Brigade Station which is located within 100 yards of the premises.



Shipping at Piers of the Hongkong and Kowloon Wharf and Godown Company

THE HONGKONG AND KOWLOON WHARF AND GODOWN COMPANY LTD

KOWLOON PROPERTY

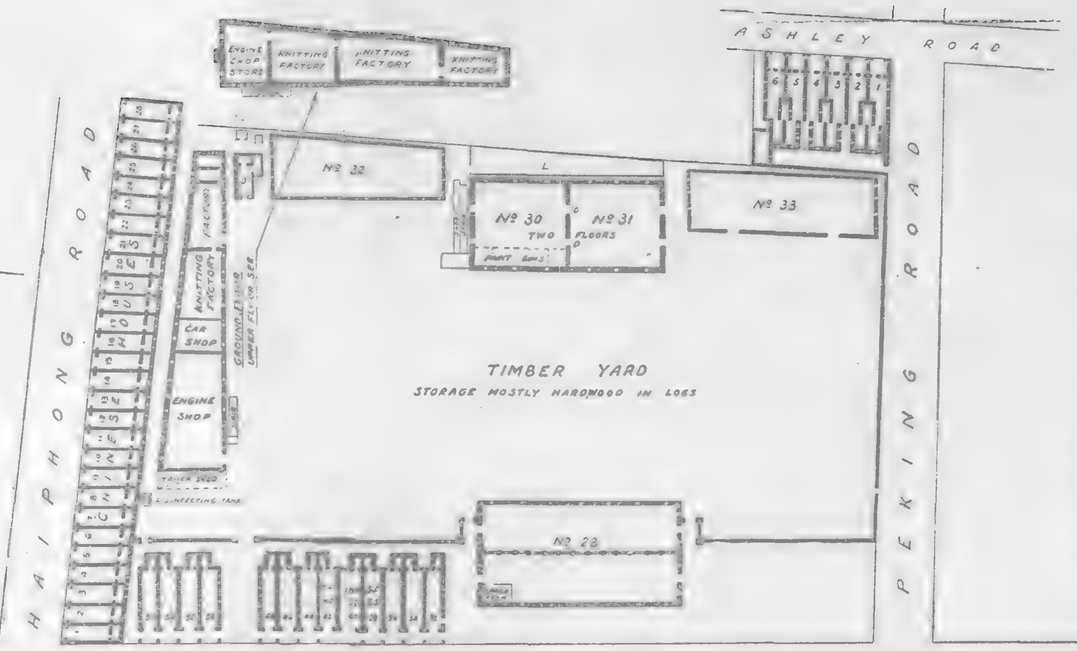
INSURANCE PLAN

SCALE 1 INCH = 60 FEET

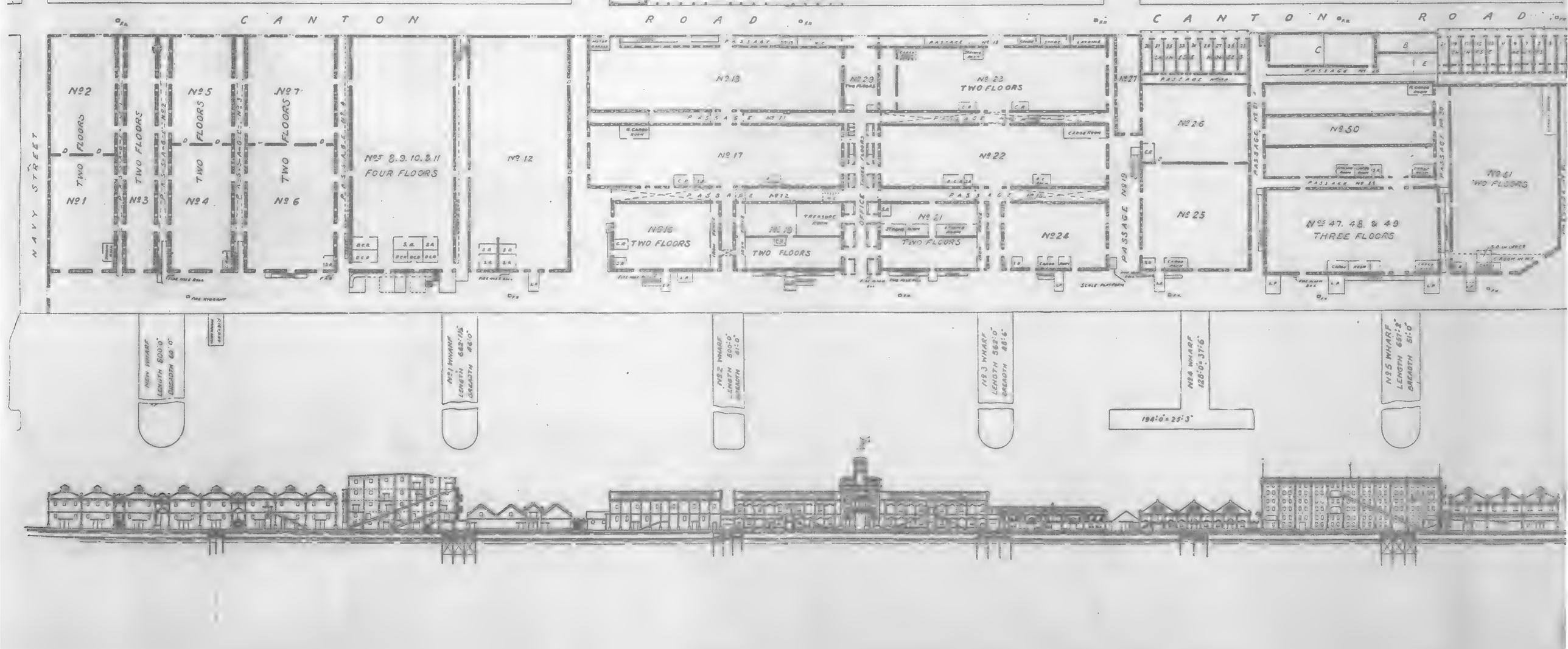
50 0 100 200 300 400 500

CORRECTED TO APRIL 1931

NOTE THE DOORS SHEWN THUS ▭ ▭ AND WINDOWS SHEWN THUS ▭▭ ARE ON THE GROUND FLOOR; WITH UPPER STORAGE GODOWNS IT MAY BE TAKEN FOR GRANTED THAT WHERE A WINDOW (NOT DOOR) IS SHEWN BELOW A SIMILAR ONE EXISTS ABOVE.
PASSAGES CROSS DOTTED THUS ▭▭ ARE ROOFED.
OPENINGS MARKED D HAVE DOUBLE IRON DOORS: REMAINDER SINGLE



GODOWN No	WALL	PRINCIPALS	ROOF	SHUTTERS	EXTERNAL DOOR
1 & 2	BRICK	IRON	TILES	IRON	IRON
3	"	"	COR IRON	"	"
4 & 5	"	"	"	"	"
6 & 7	"	"	TILES	"	"
8.9. 10. 11	"	CONCRETE	CONCRETE	"	"
12	GRANITE	WOOD	TILES	"	WOOD
16	BRICK	IRON	TILES	"	IRON
17	COR. IRON	WOOD	COR IRON	WOOD	WOOD
18	BRICK	"	"	"	"
19	GRANITE	"	TILES	"	"
OFFICE	BRICK	CONCRETE	CONCRETE	"	WOOD
21	GRANITE	WOOD	TILES	"	"
22	BRICK	"	"	"	"
23	"	IRON	"	IRON	IRON
24	"	WOOD	"	WOOD	WOOD
25	"	"	"	"	"
26	"	"	"	"	"
27	COR IRON	"	COR IRON	"	COR IRON
28	BRICK	"	TILES	"	IRON
29	"	IRON	"	IRON	"
30 & 31	"	"	"	"	"
32 & 33	COR IRON	WOOD	ASBESTUS	WOOD	WOOD
47 48 49	BRICK	CONCRETE	CONCRETE	IRON	IRON
50	"	WOOD	TILES	WOOD	"
51	"	IRON	"	IRON	"
A	"	WOOD	"	COR IRON	COR. IRON
B	"	IRON	COR IRON	WOOD	COR. IRON
C	"	WOOD	TILES	"	WOOD
D	"	IRON	COR IRON	"	IRON
E	"	WOOD	TILES	"	WOOD
L	COR IRON	"	COR IRON	"	COR IRON
WAREHOUSE	BRICK	"	TILES	"	IRON





Sungari River Steamer "Kwan Tsin" built by the Skoda Works at Harbin

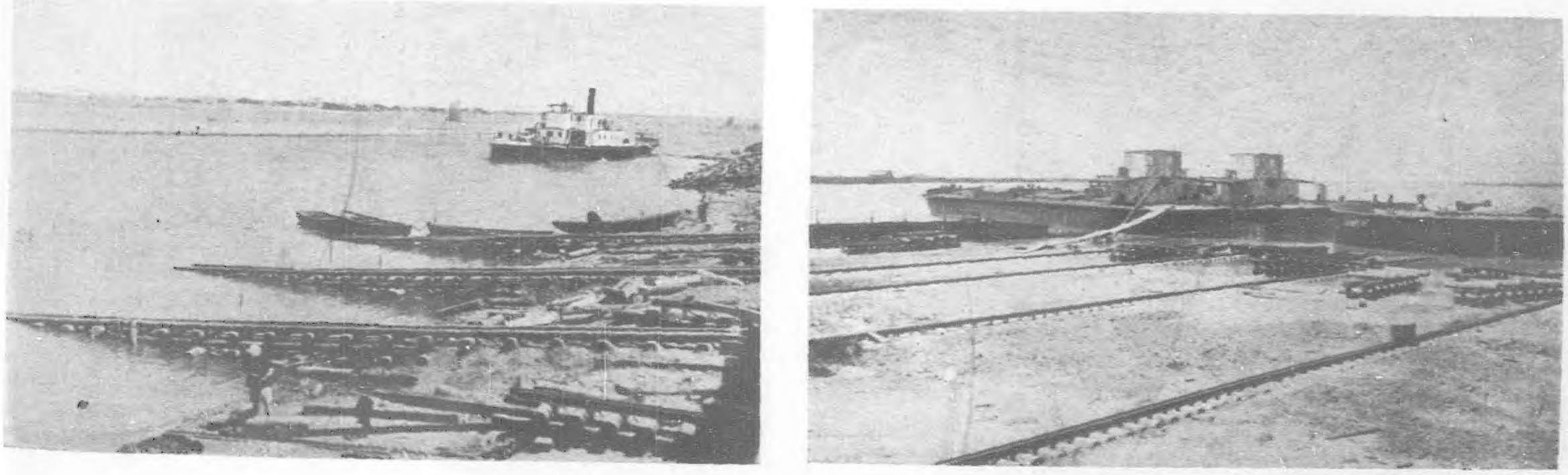
Shipbuilding on the Sungari

The Experience of the Skoda Works Shipyards at Harbin

THE development of navigation on the Amur is closely linked with the problems involved in China's sovereignty over her inland waterways and her rights to equality on that part of the Amur forming her boundary with Russia. The traffic requirements of the vast Northern Manchurian wheat lands, especially those located in or contiguous to the Amur and Sungari valleys, can be best served by the cheaper water routes, a situation that calls for the construction of a large fleet of shallow draft steamers and barges. Probably one of the most profitable and promising industries in China is the building of cargo vessels for the Sungari traffic, which is growing by leaps and bounds as the valley becomes more densely settled. Recognizing the brilliant prospects of this region, the well known Czecho-Slovakian firm of Skoda some time ago purchased a site for a shipyard on the banks of the Sungari near Harbin, drained and improved the property, erected its plant and started in business. Czecho-Slovakia has never enjoyed extraterritorial privileges in China. Its nationals who reside and do business in this country are subject to Chinese law, living under these ideal legal conditions that will bring the greatest benefits to those who do likewise and consent to an immediate surrender of their extraterritorial rights. So we are told by our Chinese friends. The Skoda Works, operating within the treaty which gives them equality under Chinese law, invested their capital in erecting a shipyard and during the first year of operations built four steamers and four steel barges and had several other important orders for new construction on its books. What happened to the Skoda Works Shipbuilding Yard in Harbin is best told by the correspondent of the *North-China Daily News*. Although the incident is now almost



Sungari Barges under Construction at the Skoda Work-yards in Harbin



Slipways for Launching Barges at Harbin

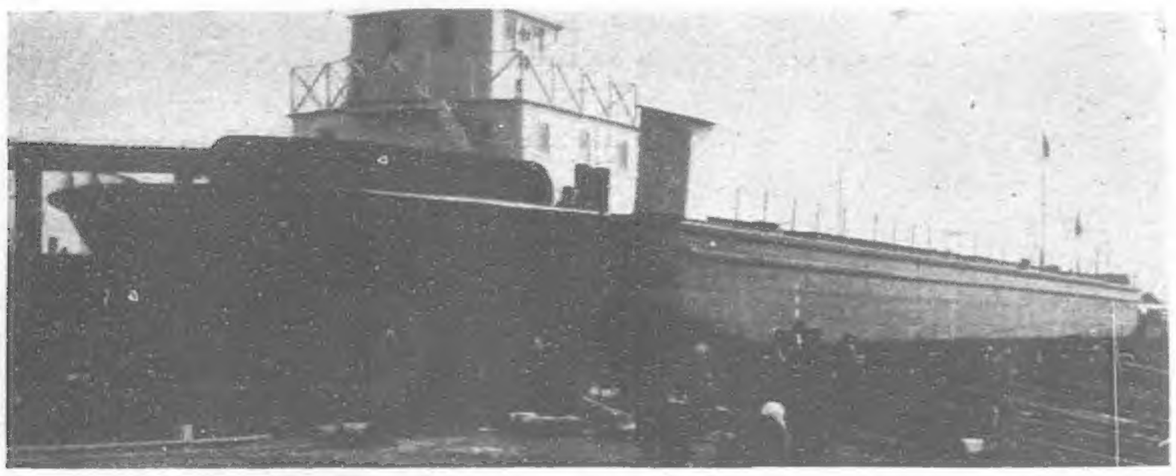


Sungari Steamer "Pan Sian"



Steamer Completed after Launching

a year old, it is typical of what may be expected when all the "unequal treaties" are a thing of the past. Since that time there have been many other indications that the policy of Nationalist China "conscious of its power and ability to enforce its will on Chinese soil against any outside Power," is to substitute the existing so-called unequal treaties by others that place the foreigner on a footing of inequality in this country. It is becoming more and more evident that while China will insist upon its right to peacefully penetrate other countries and transform them into commercial colonies of her own, she is determined that the foreigner shall be denied the reciprocal right to engage in profitable business or industry in China. Chinese in the Philippines, in Indo-China, in Siam, in the Federated Malay States, in the Dutch East Indies, in Cuba and elsewhere, are amassing hueg



Barge Ready for Launching at Harbin



Fleet of Completed Steamers and Barges

fortunes from their exploitation of the peoples who have admitted them on a footing of equality. Even in the United States, the Chinese are piling up large fortunes through their practical monopoly of the restaurant business. Whether or not the foreigner is to be conceded similar rights in China on the abolition of extra-territoriality, is perhaps the major question involved in the present treaty revision negotiations. The experience of the Skoda Works throws an interesting sidelight on how the new Chinese theory of equality works out in practice. We quote from the *North-China Daily News* article :—

"Without any warning the well known Czecho-Slovakian firm of Skoda, which is showing much engineering activity in Manchuria, has received a sudden "bomb-shell" in the way of an order to close down their new shipbuilding yard in Harbin within seven days.

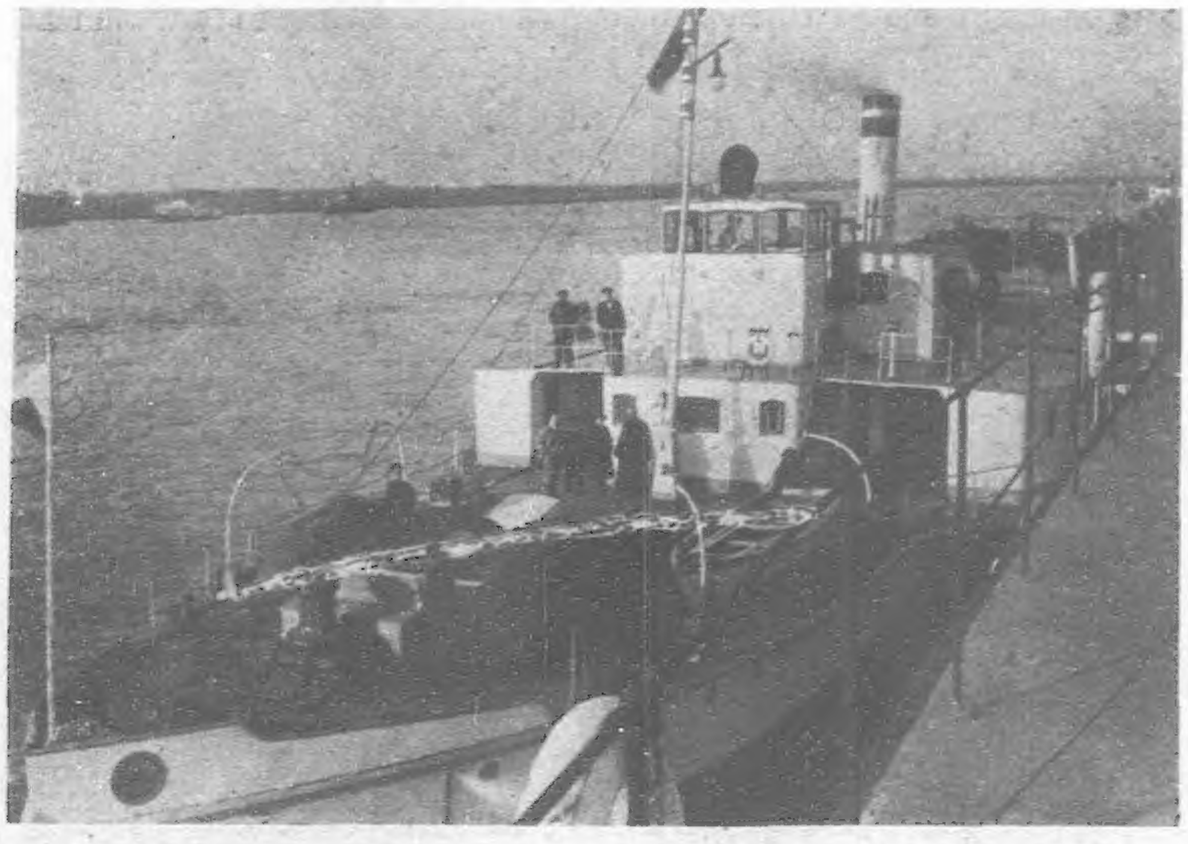
"This order has been received by the local authorities from Mukden, who no doubt in their turn received instructions to this effect from Nanking, based on the Inland Waters regulations, which prohibit any foreign firm from carrying on shipbuilding or dock enterprises on the inner rivers of China.

"But as such regulations exist, one asks the question how it was that the Manchurian authorities, who cannot plead ignorance, permitted the Skoda Works to start on this enterprise, and spend large sums of money.

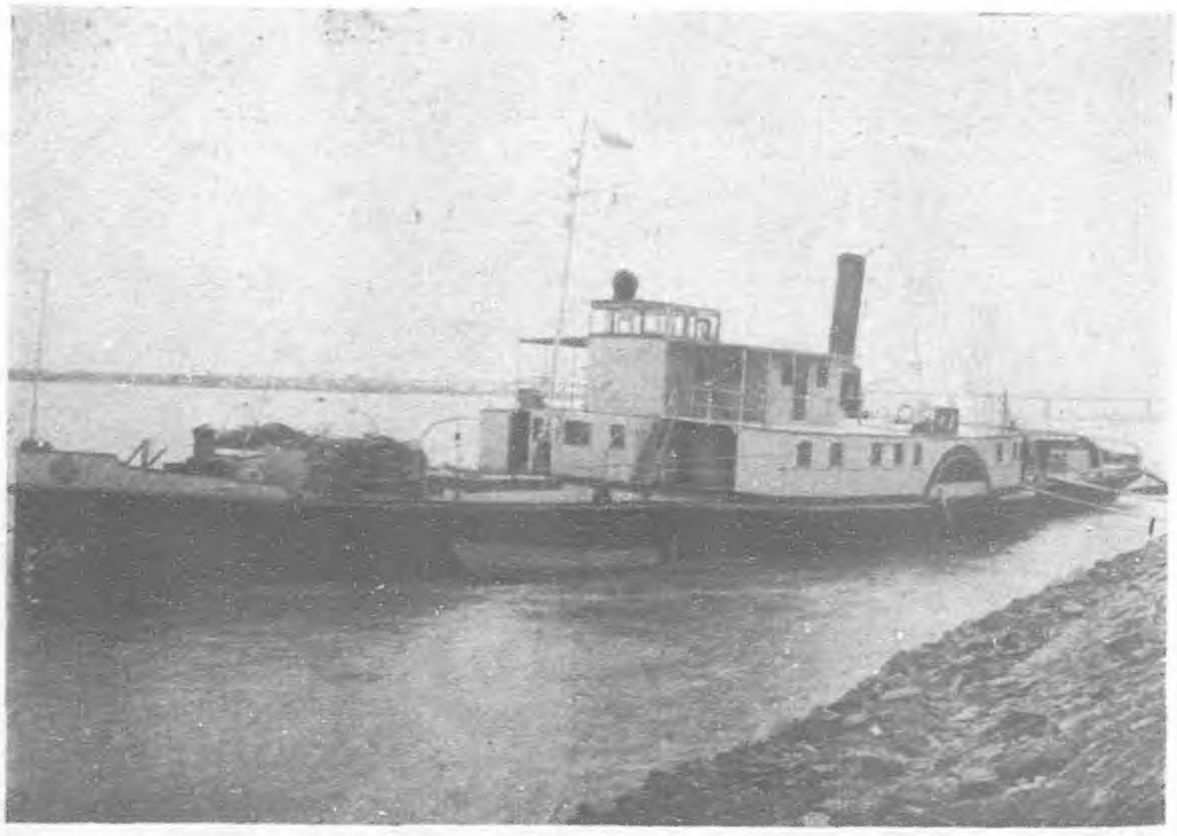
"It is not only unjust but it is also 'not playing the game' as will be seen by the following facts. The site chosen by Skoda was formerly a swamp in the suburb of Chinhai on the bank of the Sungari, and considered by residents of Harbin as entirely unfit for industrial, agricultural or any other purpose. The land was, however, bought by the firm from the Government Land Department of the Special C.E.R. District and measured about 11 acres.

"To make it suitable for a shipbuilding yard it had first to be drained and some 500 piles then driven into the ground and the whole area covered with a thick layer of earth, more than 3,000 cartloads being brought to the site, whilst the other portion of the land had also been improved.

"A number of houses and barracks have been erected for the use of the workmen at the yard, besides mechanical workshops, an office building and a number of outhouses, etc. There is also a five-ton mechanical crane for the discharging ships, besides



Sungari River Steamer "Kwan Nan built at Skoda yards, Harbin



Steamer Chun Win built for the Chun Win Company

stocks and ship-launching station. The same firm has also constructed a special branch line which links up the shipbuilding yard with the trunk line of the C.E.R. During the winter months four steamers and four steel barges have been constructed in the yards, and have now been launched with two exceptions, two of these steamers were ordered by two different Chinese firms and two by the Chinese-owned Hokang Collieries located near Sansing down theriver.

"It will thus be seen that the Skoda Works had their hands full immediately after they had bought and reclaimed the land, and that all this activity was well known to the Chinese authorities especially as permission had been also given by the Department of Communications at Mukden to the Chinese for the building of the steamers and barges.

"There is no doubt that shipbuilding will prove to be a very profitable business here as navigation on the Sungari will continually increase as the Sungari valley becomes more densely populated by the thousands of new settlers that are yearly being brought into Manchuria. The present vessels with few exceptions are all old and worn out, and those which need not be scrapped will have to have their machinery replaced or repaired which will give continual work to such enterprises.

"In addition to the Skoda Works, the Hamburg firm of Keldbrandt & Sons, who built one steamer last winter, and have several new orders for this year have also acquired a long lease of suitable land for their shipbuilding yard, which they also bought in a legal manner from an important official connected with the Navy Yards, paying a substantial sum for the land. They, too, will suffer heavy monetary losses should they be forced to be closed down as they have already component parts of new vessels that are on their way to Harbin to be erected there.

"Apparently in the case of the Skoda Works, complaints have been made by certain parties that their shipbuilding business is both illegal and irrational as the firm grants three and four years credit to Chinese who give orders for steamers and barges on the river, the capital and accruing interest to be paid out of the future earnings of the vessels, which causes the "owners" to remain.

"These same parties point out that Chinese could not give such credits if they were in the shipbuilding business, and that the Mukden Government should grant a substantial subsidy to assist Chinese to start shipbuilding yards! The actual starting of a shipyard requires a large capital in the first instance and as would-be owners of steamers, etc., are not in a position to pay cash for any vessel, it is extremely doubtful, seeing that Chinese want quick return for any capital invested, whether for the next few years purely Chinese capital will be forthcoming.

"The fact of these foreign shipyards being established will not only give employment to thousands of laborers, but also will teach Chinese how to build the latest and best types of vessels required by the river trade. Foreign capital and enterprise in Manchuria in every form should be encouraged for the next few decades, in order that the rapid development of this vast territory can take place. There is at present not enough local Chinese capital to adhere to the strict rules and regulations which Nanking has framed in order to bring into immediate effect the Nationalist programme.

"Firms like the Skoda Works, who do not hesitate to spend large sums of money in Manchuria in engineering enterprises, should be encouraged so that other firms who are now hanging back will follow suit. This firm has equipped several electric power plants for North Manchuria, it has supplied locomotives for the Hu-hai, Kai-shan and Toanan railways, it has rejuvenated the Sungari bridge on the southern section of the C.E.R., putting in new girders, and just recently delivered to the C.E.R. six new type tank locomotives."

Our correspondent in Harbin informs us that the Skoda Shipyards were permitted to resume operations after the payment of a fine of $25,000 for some petty infraction of local regulations. When a protest was made and upheld by Nanking, the Harbin authorities acknowledged their mistake, but said it would be impossible for them to return the $25,000 fine without suffering a loss of face. So they preserve their face and pocket the $25,000 fine.

ATOMIC DIESEL

COLD STARTING HEAVY-OIL ENGINE ELECTRIC GENERATING PLANTS

A PROVED SUCCESS!

TESTIMONIAL

"It will be of interest to you to know that the 160 B.H.P. ATOMIC DIESEL ENGINE (*illustrated in photograph*), direct coupled to a 100 K.W. Generator which you installed at our Works (*Glove Factory*) is performing its duties in a perfectly satisfactory manner. The Plant is supplying electricity to our Factory for both power and lighting, and fulfils in every way the high claims which you make. It is very economical and works for long hours without attention, and, due to the particularly steady running on all loads, there is no perceptible variation shown by the electric meters."

Petter Generating Plants are made in sizes from ¾ K.W. to 270 K.W. for providing Electric Light and Power for Farm, Home, Shop and Factory, Public Buildings, Towns, Villages, etc. Automatic or hand control. Write for Catalogue.

The manufacture of the famous Westland Military and Civil Aeroplanes is also a branch of the business of Petters Limited

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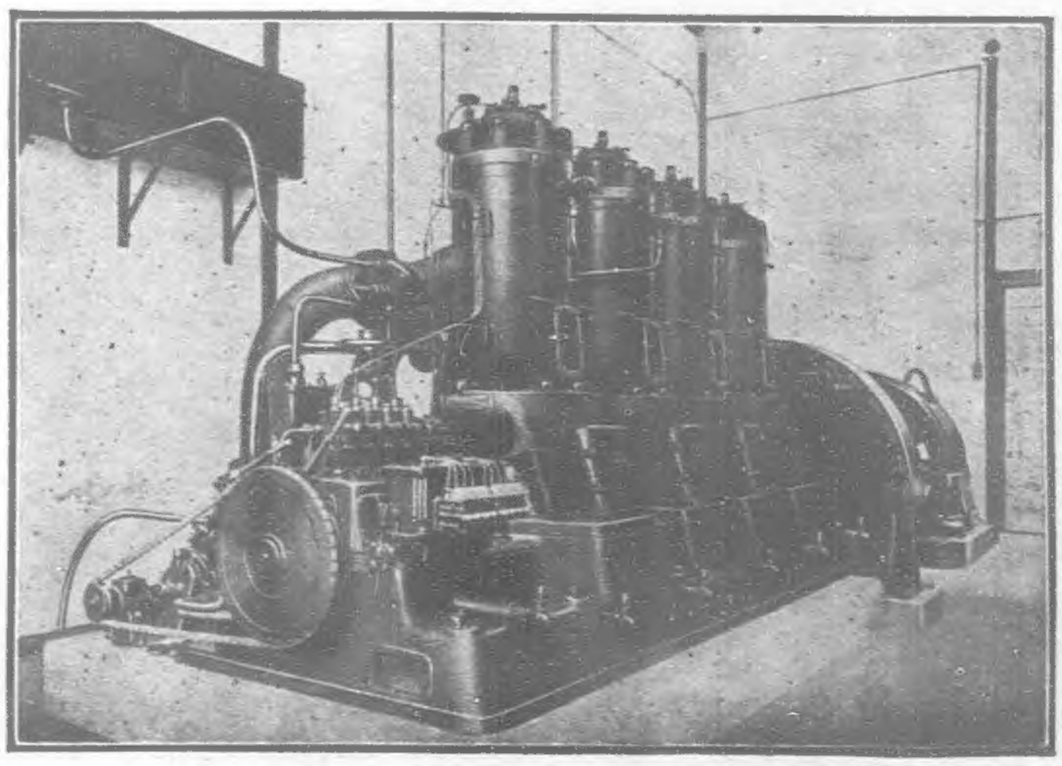
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Manufactured by

PETTERS LTD. YEOVIL



The Product of 35 Years' Experience in Oil Engine Manufacture

New Messageries Maritimes Motor Liner "Felix Roussel"

(Continued from page 385).

The different frozen-cargo and refrigerated-cargo holds and stores have a total capacity of 367 tons.

A new and very attractive feature of the *Felix Roussel* is a spacious garage. A special stowage device prevents all risks of damage during the voyage.

The loading apparels include: one 25 ton derrick; one 10 ton derrick; six 5 ton derrick and ten 3 ton electrically driven cranes.

Passenger Accommodations

The *Felix Roussel* can accommodate:

196 1st class passengers in grand-luxe and demi-luxe suites and single and two-berth cabins. There are only six three-berth cabins.
113 2nd class passengers in two and three-berth cabins.
90 3rd class passengers in two and four-berth cabins.
670 to 800 4th class passengers.

For the convenience of passengers travelling with large families, cabins are connected by doors, so that two, three or four cabins can be converted into a real private flat. A large number of first class cabins are fitted with a private shower-bath.

All cabins de luxe and 18 first class cabins have a private deck. Instead of a port-hole, these cabins are provided with a large french-window leading to a private terrace occupying the whole length of the cabin and neatly furnished with rattan and teak wood table and chairs.

Passengers will be able to read or rest without being disturbed. It will also greatly add to the aeration of the cabins. In case of rain or bad weather, or during the cold season, these balconies can be entirely closed by extra-strong glass windows, changing them into very snug winter verandahs.

All the cabins of the *Felix Roussel* show a very great advance on anything that has been done before. Instead of being painted in white, all the cabin walls are cased with beautiful waxed wood. The chief woods used are birch, ash wood, satin wood and zebra wood. Fine engravings from pictures of XVIIIth and XIXth century masters are set, with dainty frames, on the walls and give to each room its own individual appearance.

Electric ventilation by punkah louvres of the Thermotank C° is installed throughout the ship. For heating, both electric and steam systems have been adopted. Electric radiators are fitted in first class accommodations, while second class is steam heated.

Special care has been given to the water supply. All fresh water is filtered, even for toilet use. Hot and cold fresh water is supplied in cabins de luxe, other accommodations having fresh cold water while hot sea water is supplied in baths and shower-baths.

Besides the ordinary writing-room, there is a special writing room on the boat deck for those who wish to work or write in absolute quiet. Business men, intellectuals, etc., will find there a technical library with books concerning the countries at which the *Felix Roussel* calls. A short-hand typist will be at their disposal in order to make notes of all information that they find of interest.

The swimming pool is very spacious, it has eight feet at the deep end. The running water is kept warm just enough to make bathing enjoyable at any time. Two powerful lights are fitted at the bottom of the pool. Hot fresh water showers have been installed in the dressing-boxes. On one of the sides of the room there is a small bar very prettily decorated, with rubber-covered seats, in order that neither bathing suits nor furniture be spoiled.

On the boat-deck there are ping pong tables, a large tennis-court and many other deck sports.

Another very interesting feature is a bridge that has been fitted between the two funnels, and from which a wonderful view is obtainable. Passengers will certainly much appreciate this when entering port for instance.

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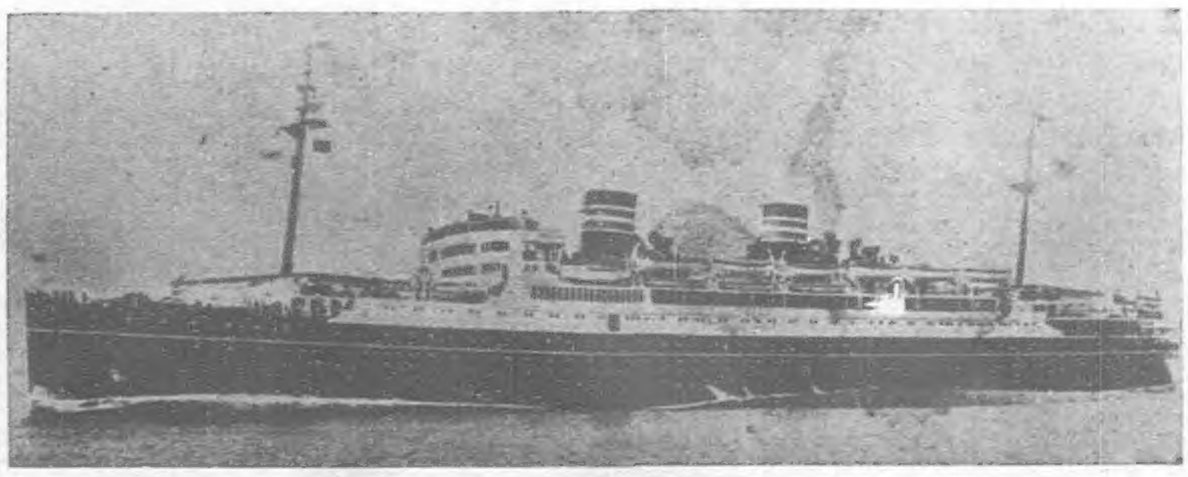
SULZER BROTHERS

SHANGHAI ENGINEERING OFFICE

4 AVENUE EDWARD VII.

Telegraphic Address
"SULZERBROS" SHANGHAI
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